



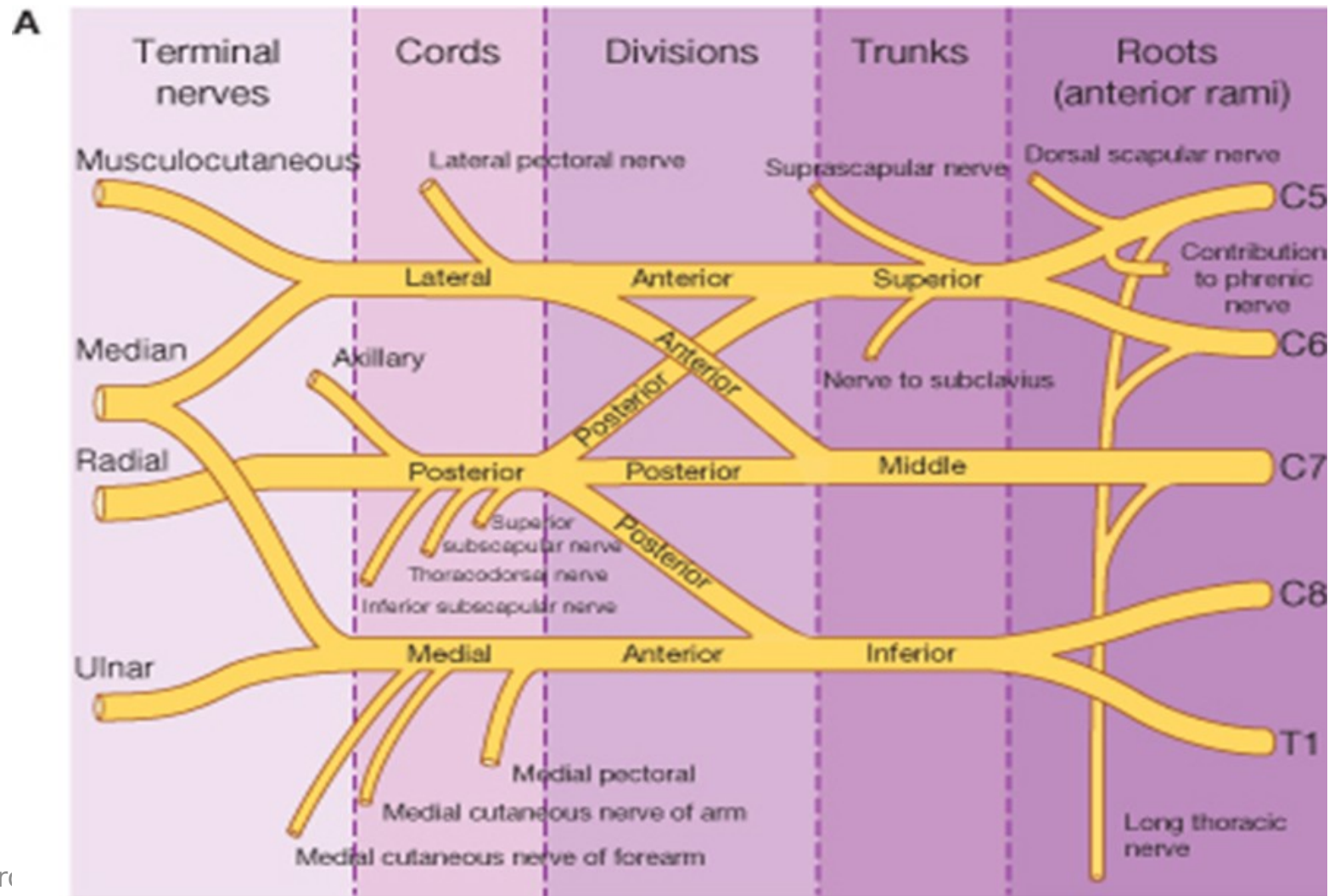
# **Armed Forces College of Medicine AFCM**



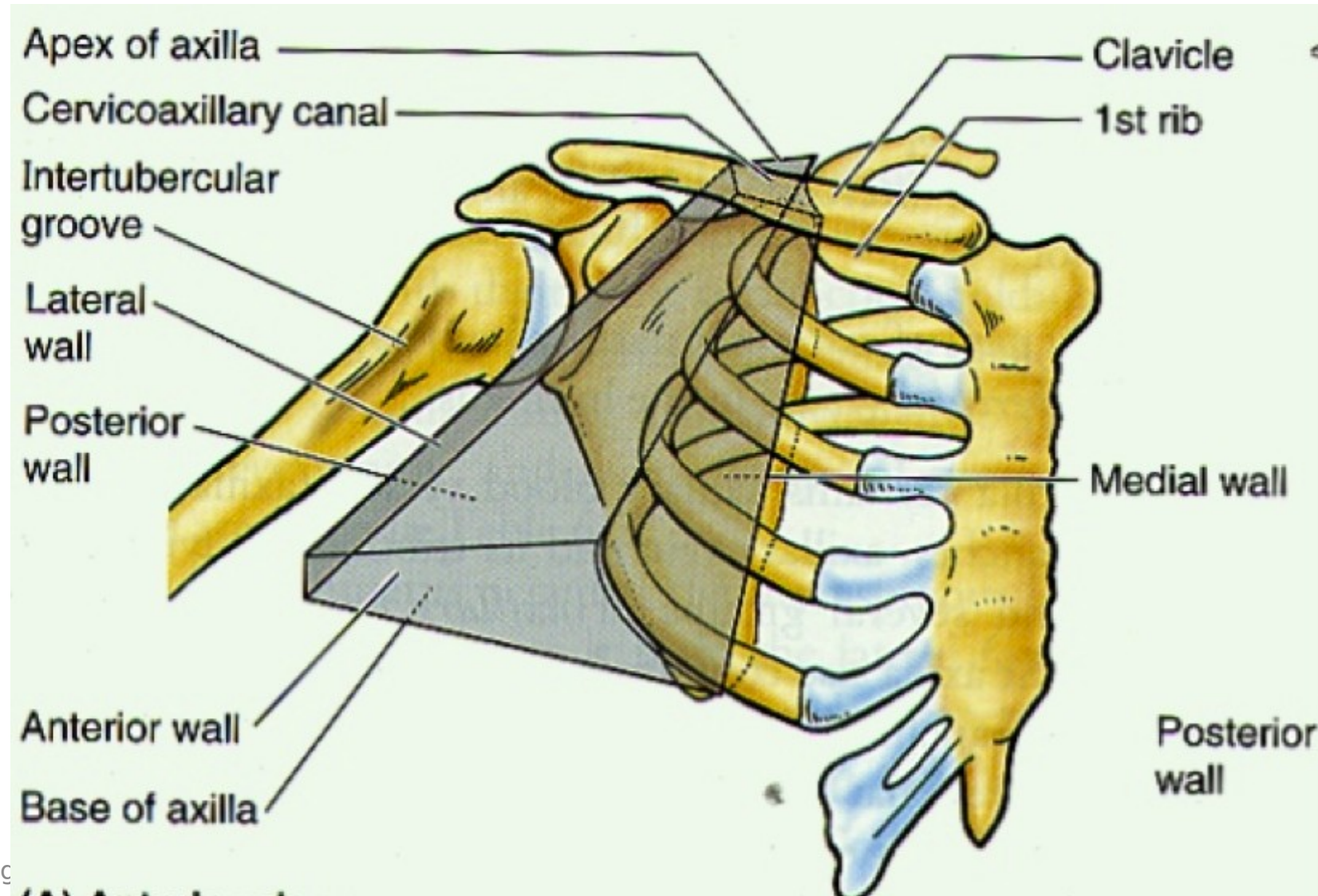
# **Anatomy Remediation**

## **Dr: Shereen Adel**

# Brachial plexus:

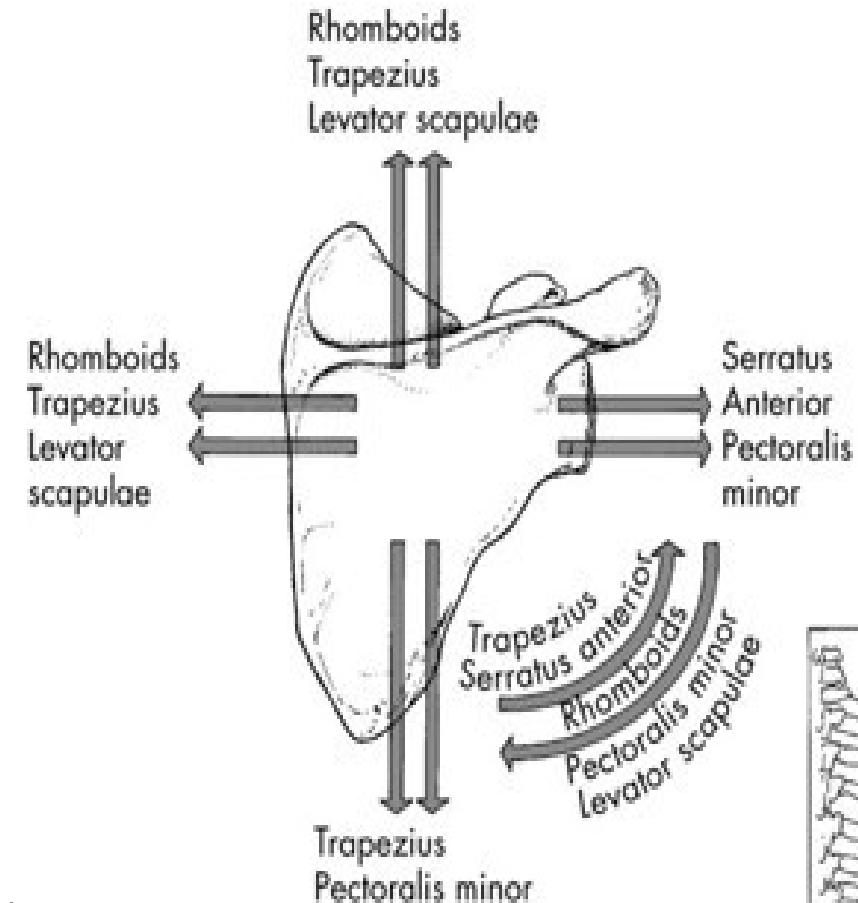


# Axilla:



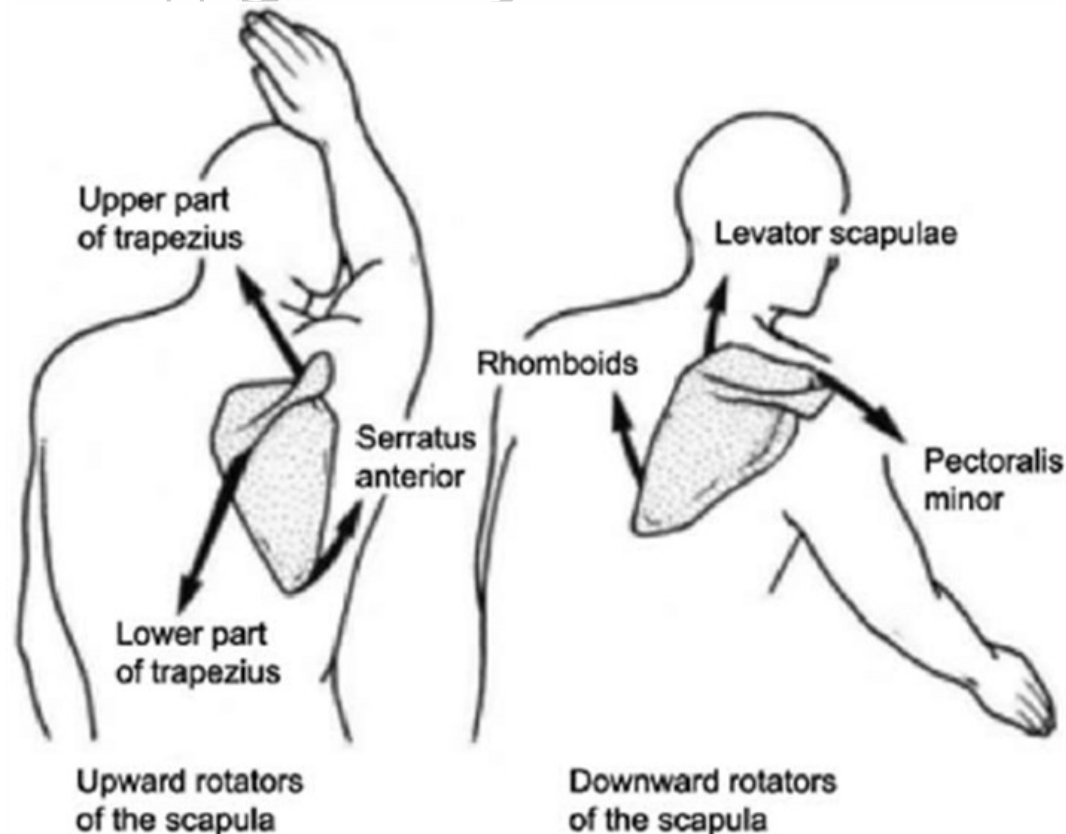
# Scapular movements include

1. **Elevation** □ upper fibers of trapezius & levator scapulae
2. **Depression** □ lower fibers of trapezius, pectoralis minor & serratus anterior
3. **Protraction** □ pectoralis minor & serratus anterior
4. **Retraction** □ trapezius & rhomboids



# Scapular movements include

1. **Rotation up** as when you raise the arm above the head by upper fibers of trapezius & lower digitations of serratus anterior
2. **Rotation down** gravity + levator scapulae, rhomboids





# Movements of shoulder joint

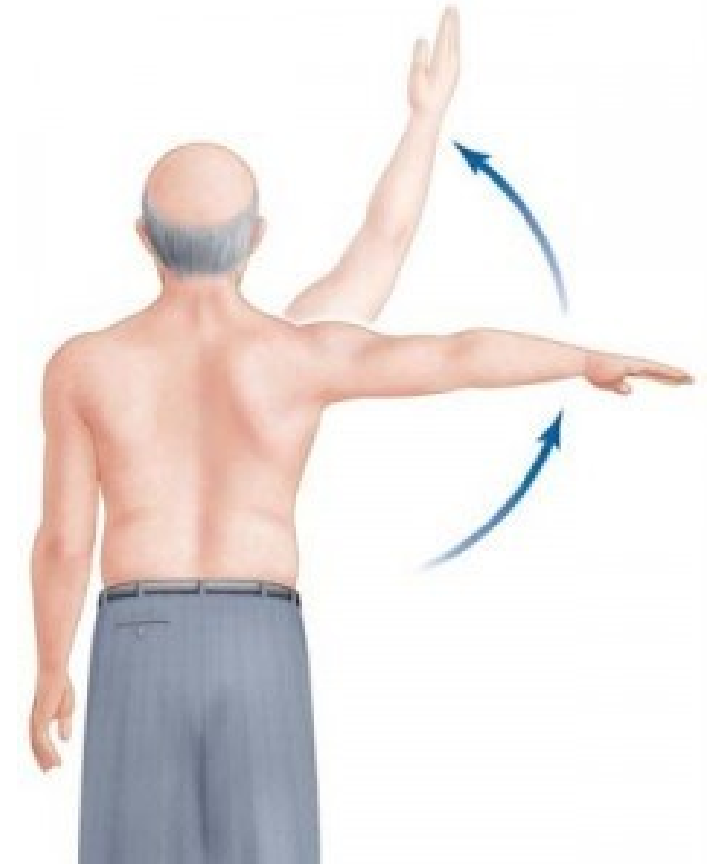
- **Flexion:** by muscles **anterior** to the joint like **pectoralis major, coracobrachialis** and **anterior fibers of deltoid**.
- **Extension:** by muscles **posterior** to the joint like **latissimus dorsi, teres major** and **posterior fibers of deltoid**.

# Abduction of the arm:

**Supraspinatus**  $\square$   $0^\circ - 15^\circ$ ,  
at shoulder joint.

**Deltoid** ( middle fibers)  $\square$   
 $15^\circ - 90^\circ$ , at shoulder joint.

**Trapezius & lower  
digitations of serratus  
anterior**  $\square$   $90^\circ - 180^\circ$ ,  
at shoulder girdle.



<https://lh3.googleusercontent.com/SuNWP1VprCafc89NZ>



**Adduction:** by the **two climbing muscles** which are pectoralis major and latissimus dorsi.

**Medial rotation:** by **muscles inserted into the bicipital groove** which  are pectoralis **major**, latissimus dorsi and teres **major** (**major-lady-major**) .

**Lateral rotation:** by **muscles attached to the greater tuberosity** which are

# Movements of elbow joint

- **Flexion** is carried by □ biceps, brachialis & brachioradialis
- **Extension** is carried by □ triceps & anconeus



<https://lh3.googleusercontent.com/shN4xraT0LDcQsuA9D20JTs>

## Movements of wrist joint

<b>Movement</b>	<b>Muscle producing it</b>
<b>Flexion</b>	<b>Flexor carpi radialis, flexor carpi ulnaris, palmaris longus, flexor digitorum superficialis, flexor digitorum profundus, flexor pollicis longus</b>
<b>Extension</b>	<b>Extensor carpi radialis longus &amp; brevis, extensor carpi ulnaris, extensor digitorum, extensor digiti minimi, extensor indicis &amp; extensor pollicis longus</b>
<b>Adduction</b>	<b>Flexor carpi ulnaris &amp; extensor carpi ulnaris</b>
<b>Abduction</b>	<b>Flexor carpi radialis &amp; extensor carpi radialis longus &amp; brevis</b>

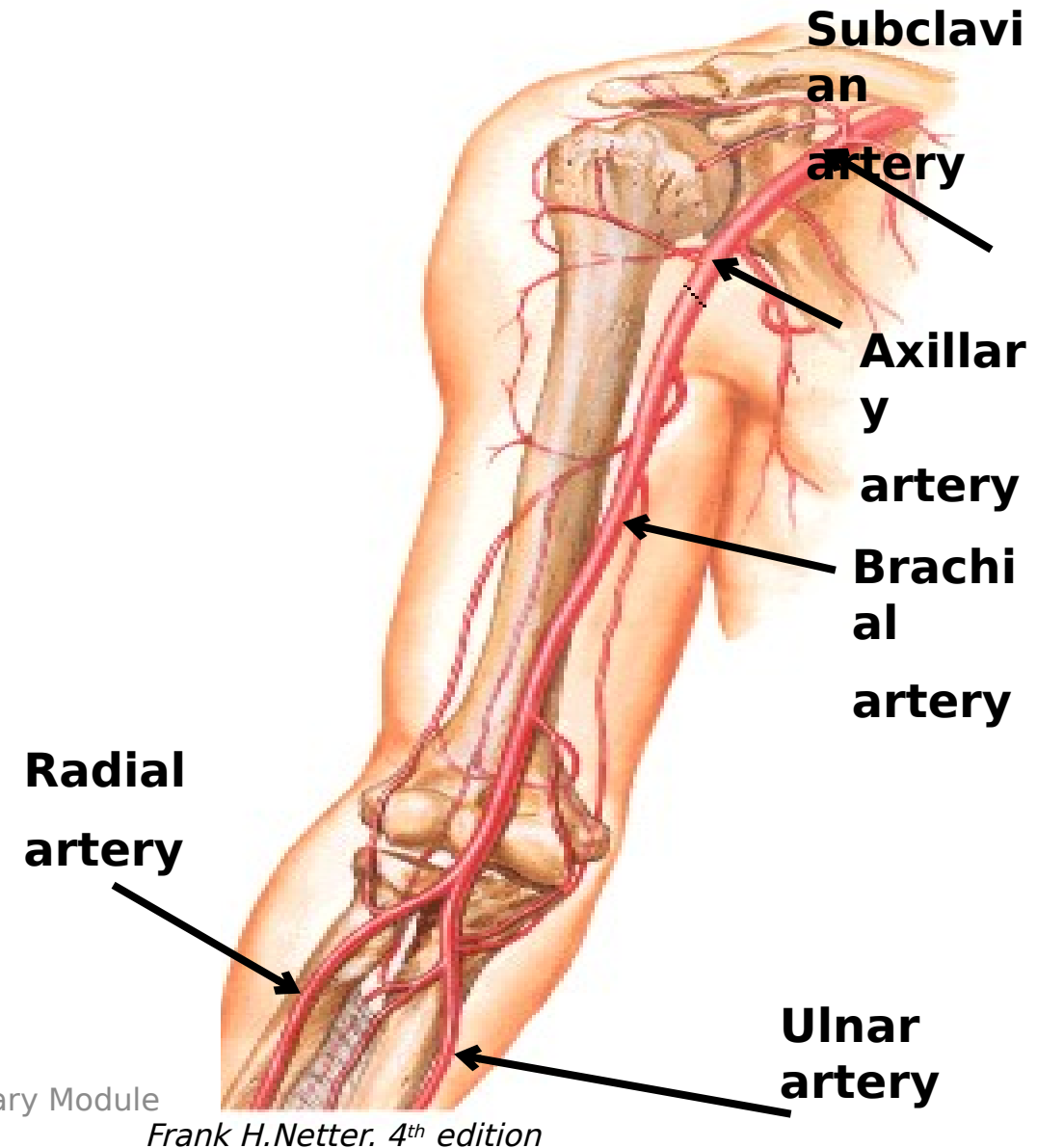
# Vessels of the Upper Limb



Axillary artery begins as the continuation of subclavian artery at outer border of 1<sup>st</sup> rib.

And continue as Brachial artery at lower border of teres major.

Which ends at the level of neck of radius by dividing into radial & ulnar arteries.



# Axillary artery

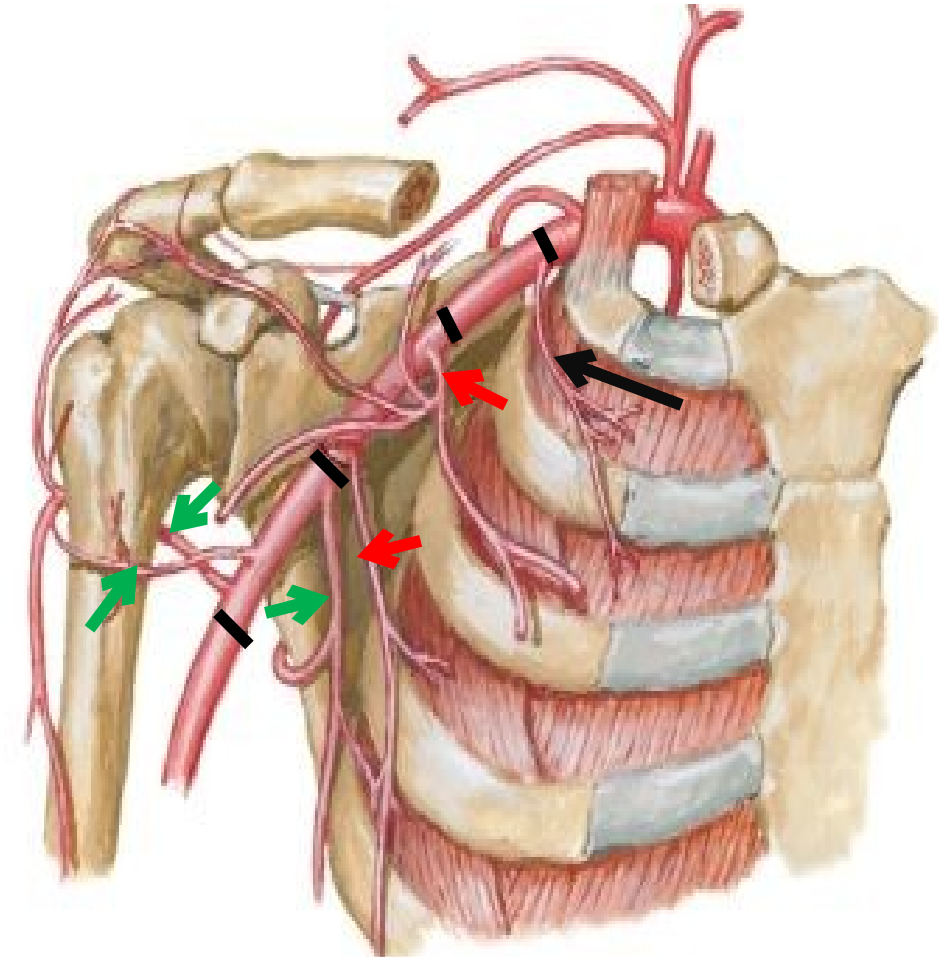


## Branches of axillary artery

First part: (one branch)  
(superior thoracic artery)

Second part: (two branches)  
1-Thoracoacromial artery  
2-Lateral thoracic artery

Third part ( three branches)  
1-Subscapular artery.  
2-Ant. Circumflex A.  
3-Post. Circumflex A.



*Frank H. Netter. 4<sup>th</sup> edition*

# Brachial artery



## Branches of brachial artery:

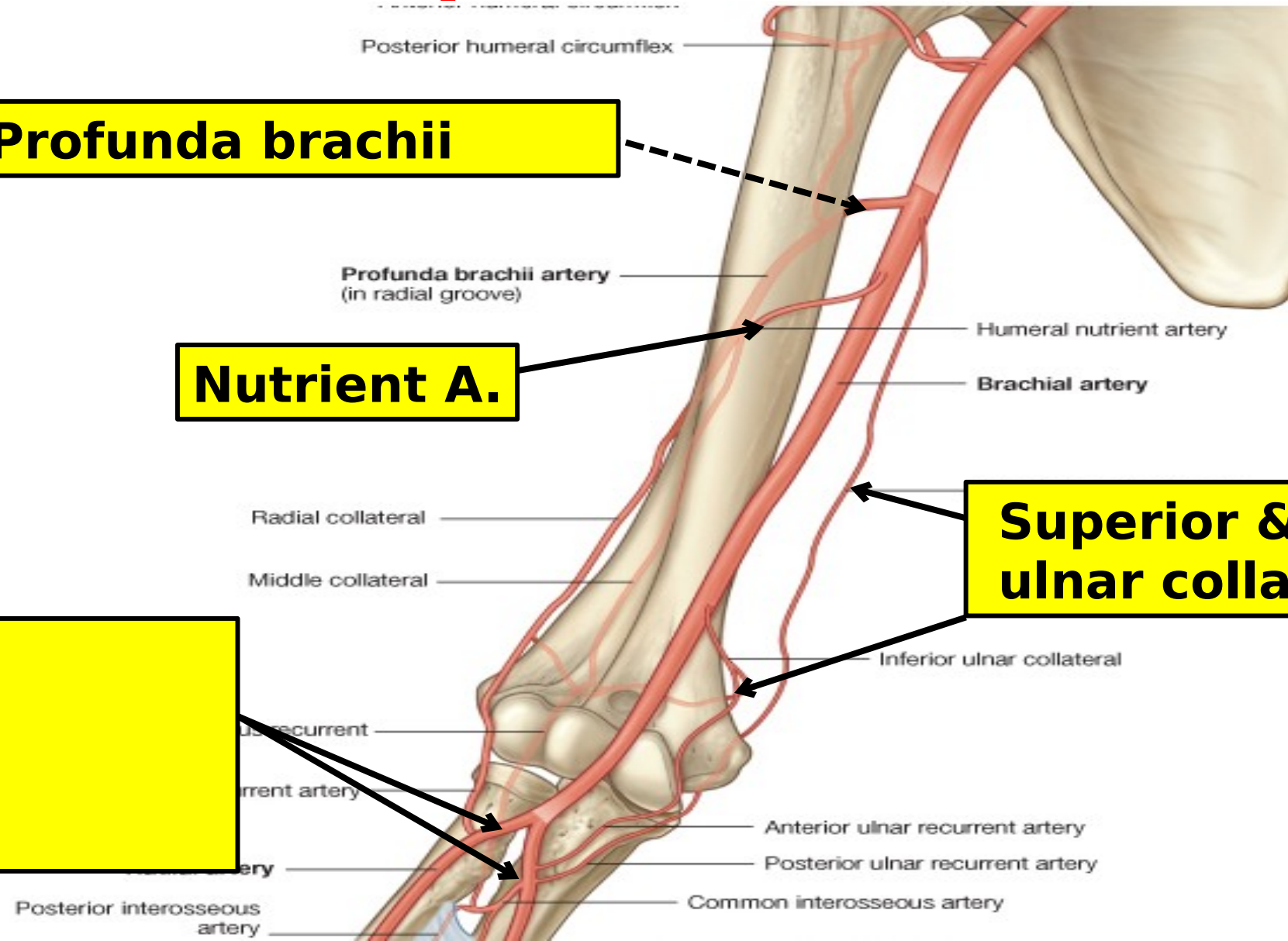
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**Profunda brachii**

**Nutrient A.**

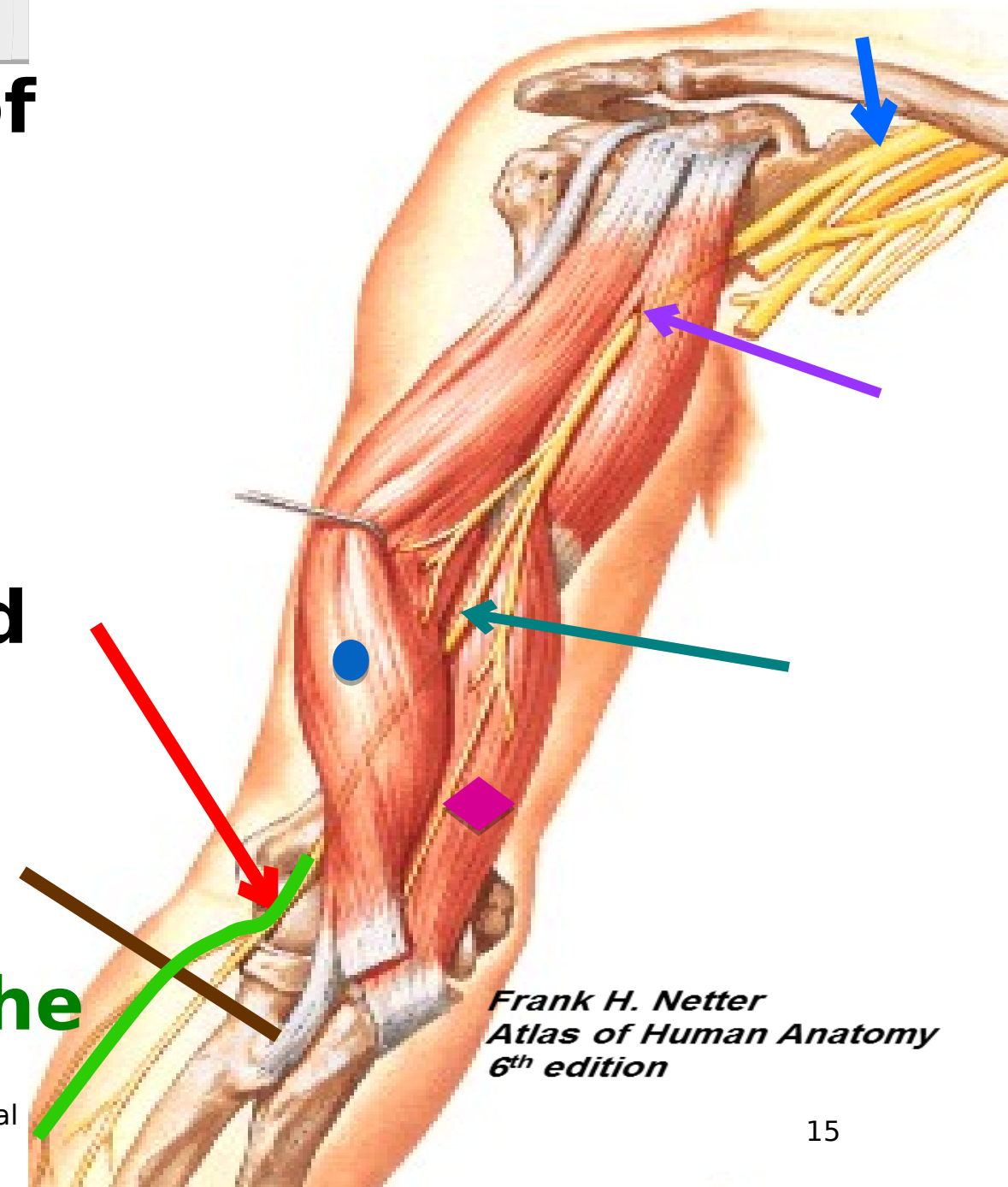
**2 Terminal Branches:**

- **Radial A.**
- **Ulnar A.**



# Musculocutaneous nerve:

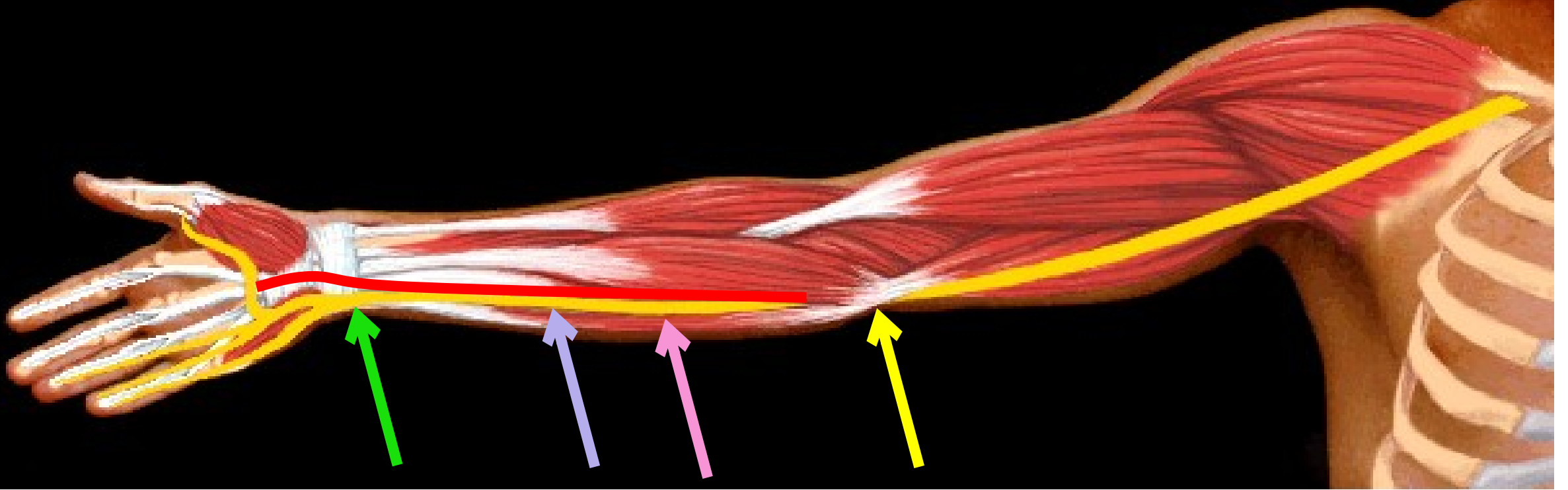
- Branch from **lateral cord** of brachial plexus C5,6,7
- Enters arm by **piercing** coracobrachialis
- Runs downwards and laterally **between biceps** and **brachialis**
- Ends **lateral** to **biceps tendon**, by becoming the **lateral cutaneous nerve of the forearm.**



Frank H. Netter  
Atlas of Human Anatomy  
6<sup>th</sup> edition



# Ulnar nerve enters the hand superficial to the flexor retinaculum



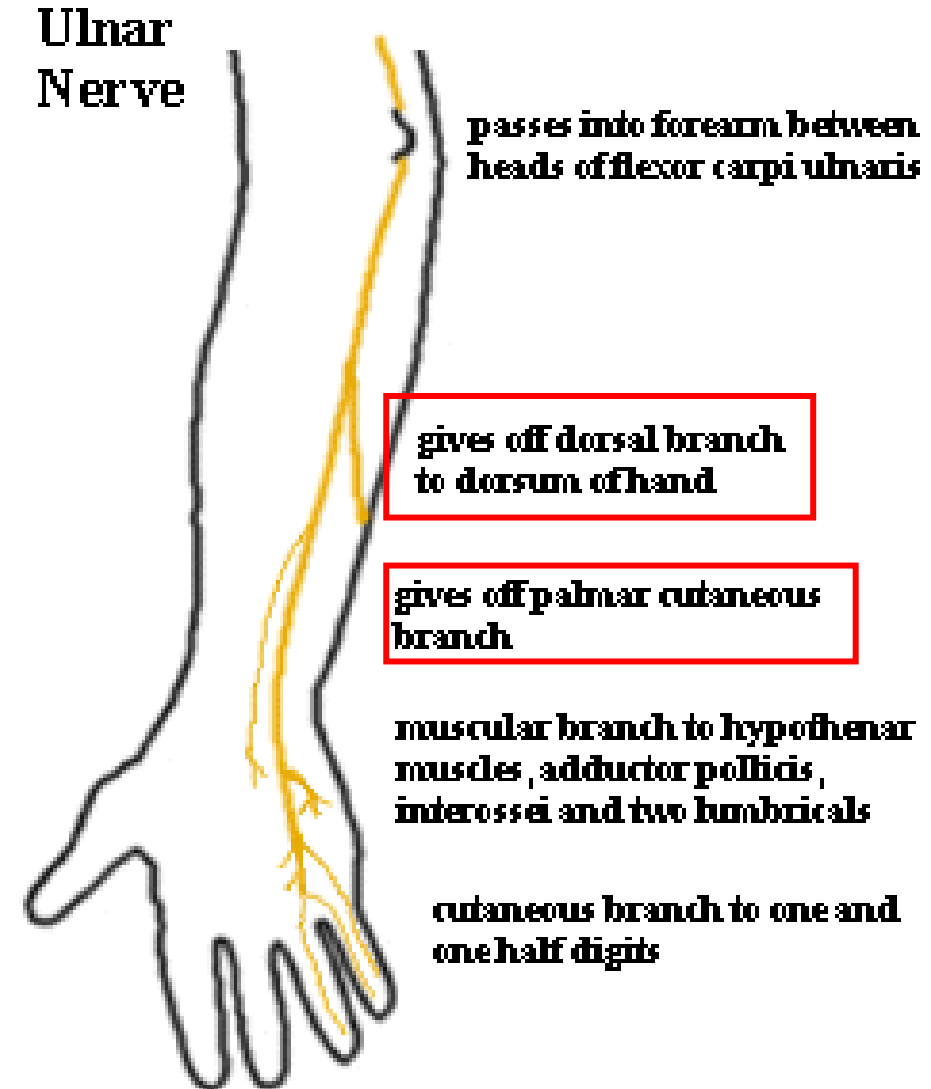
<https://www.google.com.eg/search?sa=G&hl=en-EG&q=ulnar>

6/11/24

**ULNAR NERVE**  
C7 & T1  
Prof. Azza Kamal/ Musculoskeletal & Integumentary System

# Branches of ulnar nerve in forearm:

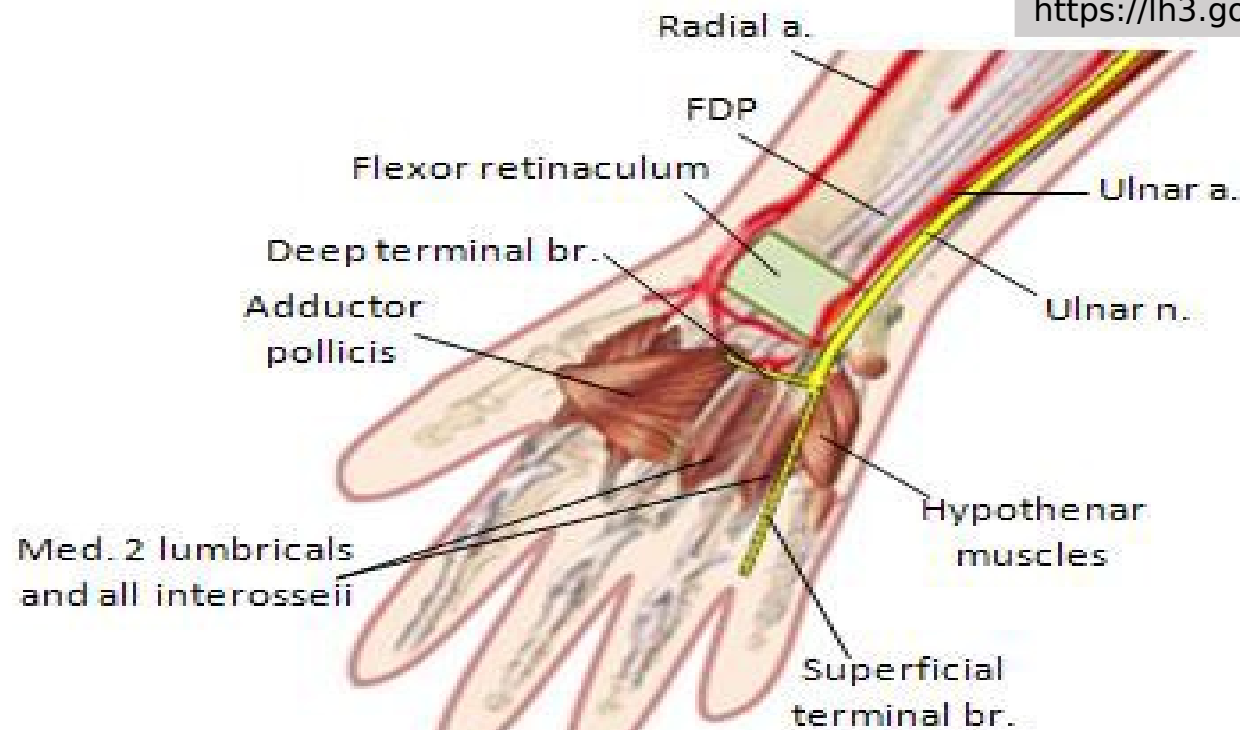
1. Muscular: to flexor carpi ulnaris & medial  $\frac{1}{2}$  of flexor digitorum profundus
2. Articular: to elbow joint
3. Cutaneous:
  - **Palmar** for skin of medial  $\frac{1}{3}$  of palm
  - **Dorsal** branch for skin of medial  $\frac{1}{3}$  of dorsum of hand & dorsum of medial  $1\frac{1}{2}$  fingers



# Branches of ulnar nerve in hand:

1. **Superficial branch** to palmaris brevis and skin of palmar aspect of medial 1½ fingers
2. **Deep branch** to hypothenar muscles, adductor pollicis, medial 2 lumbricals and all interossei

[https://lh3.googleusercontent.com/rtIXjGI\\_BnDHrxNjprVHJgdO](https://lh3.googleusercontent.com/rtIXjGI_BnDHrxNjprVHJgdO)



FDP = flexor digitorum profundus  
Prof. Azza Kamal/ Musculoskeletal & Integumentary System



palmar surface of the  
medial 1½ fingers

# LESIONS OF ULNAR NERVE

1. At wrist & elbow

**Partial claw hand** (lat 2 lumbricals intact)

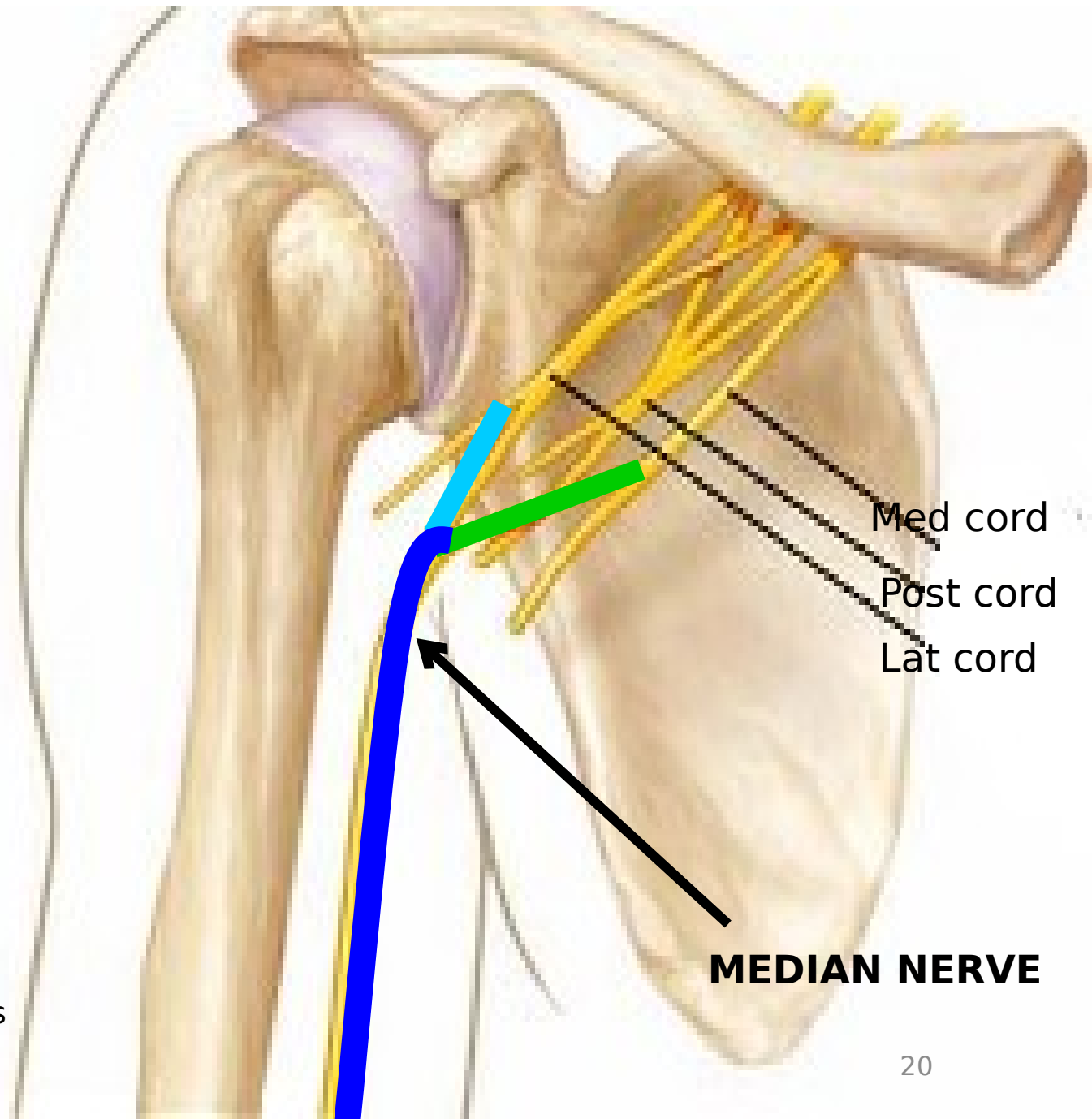


## The Median Nerve (C5,6,7,8,T1):

### ➤ Origin:

**Lateral root (C 5,6,7) from lateral cord of BP**

**Medial root (C8,T1) from medial cord of BP**



[https://lh3.googleusercontent.com/8HSvbN2cVAaVA4R2goA2SG3o55DGG3s\\_IWz8-](https://lh3.googleusercontent.com/8HSvbN2cVAaVA4R2goA2SG3o55DGG3s_IWz8-)

Prof.Az

## 1. Muscular

- pronator teres,
- flexor carpi radialis,
- palmaris longus &
- flexor digitorum superficialis

2. **Articular** to elbow and superior radioulnar joints.

3. **Palmar cutaneous** branch of median n for skin of the lateral 2/3 of the palm (hollow of palm)

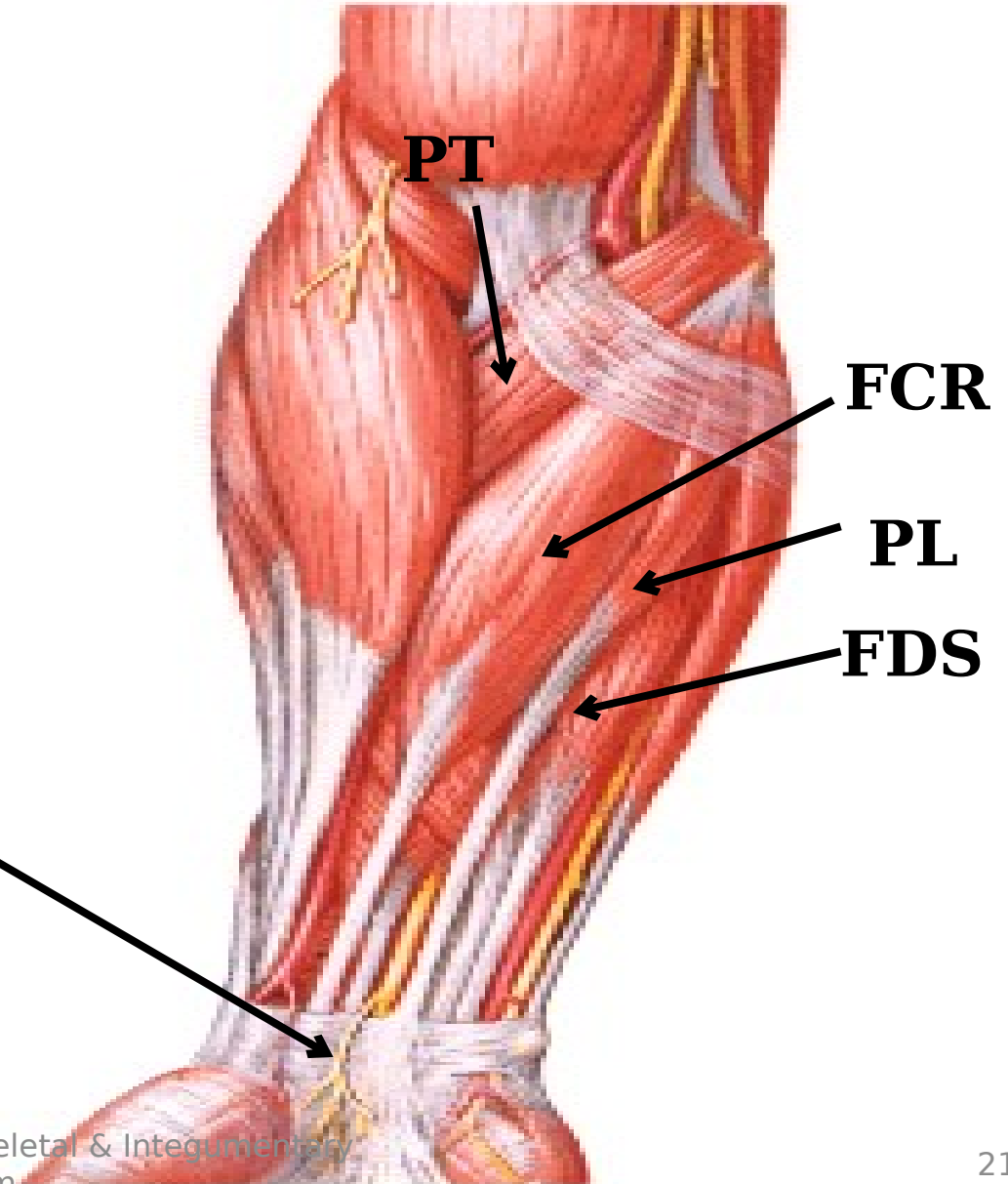


6/11/24

*Frank H. Netter  
Atlas of Human Anatomy  
6<sup>th</sup> edition*

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## Branches of the median nerve in the Forearm



## 4. Anterior interosseous nerve supplies:

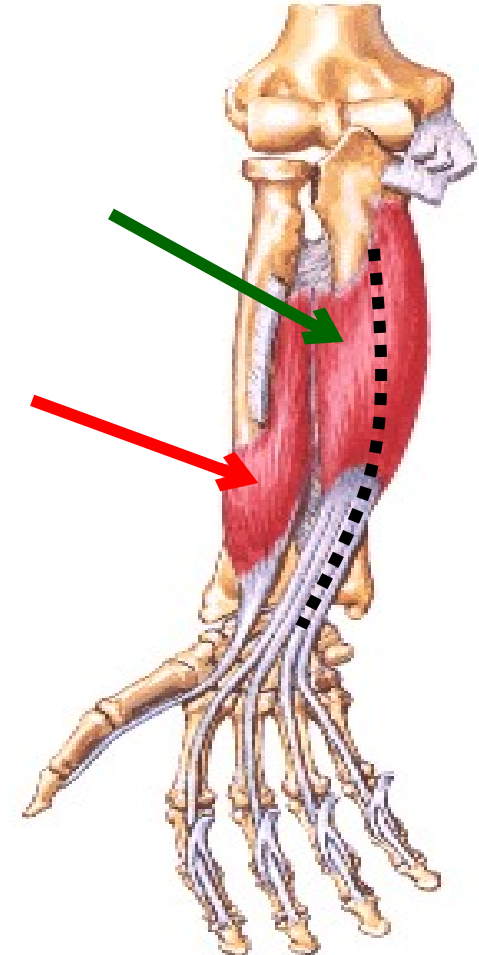
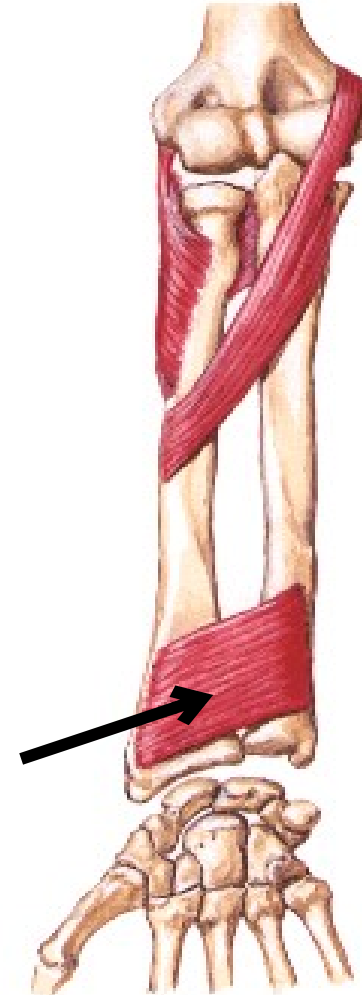
### A- Muscular:

- **flexor pollicis longus**,
- **lateral 1/2 of flexor digitorum profundus**
- **pronator quadratus**

### B- Articular branches:

to inferior radio-ulnar and wrist joints.

*Frank H. Netter  
Atlas of Human Anatomy  
6<sup>th</sup> edition*



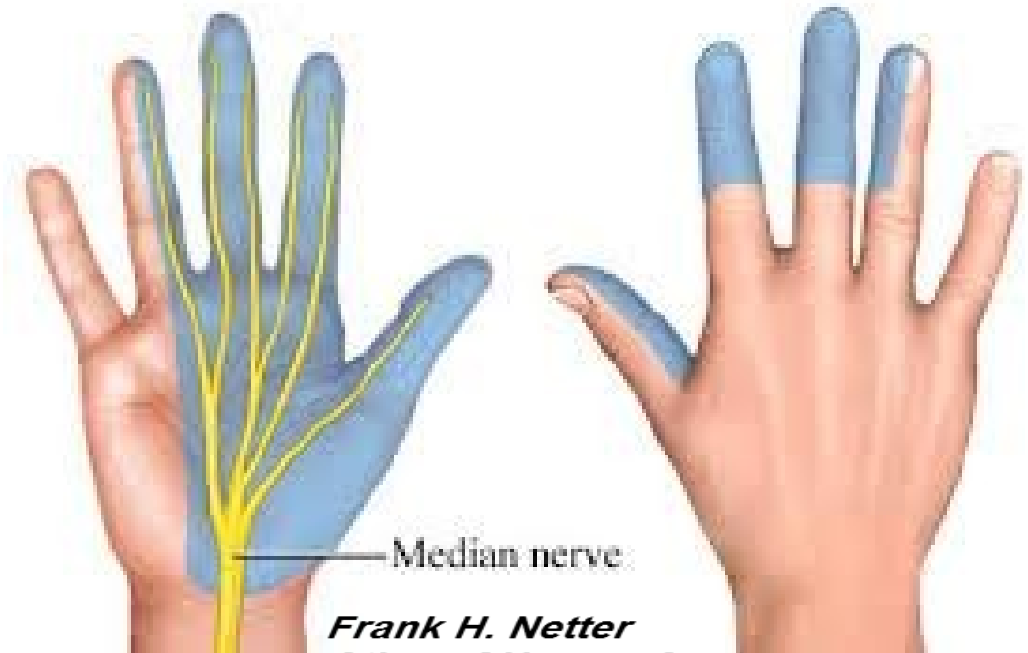
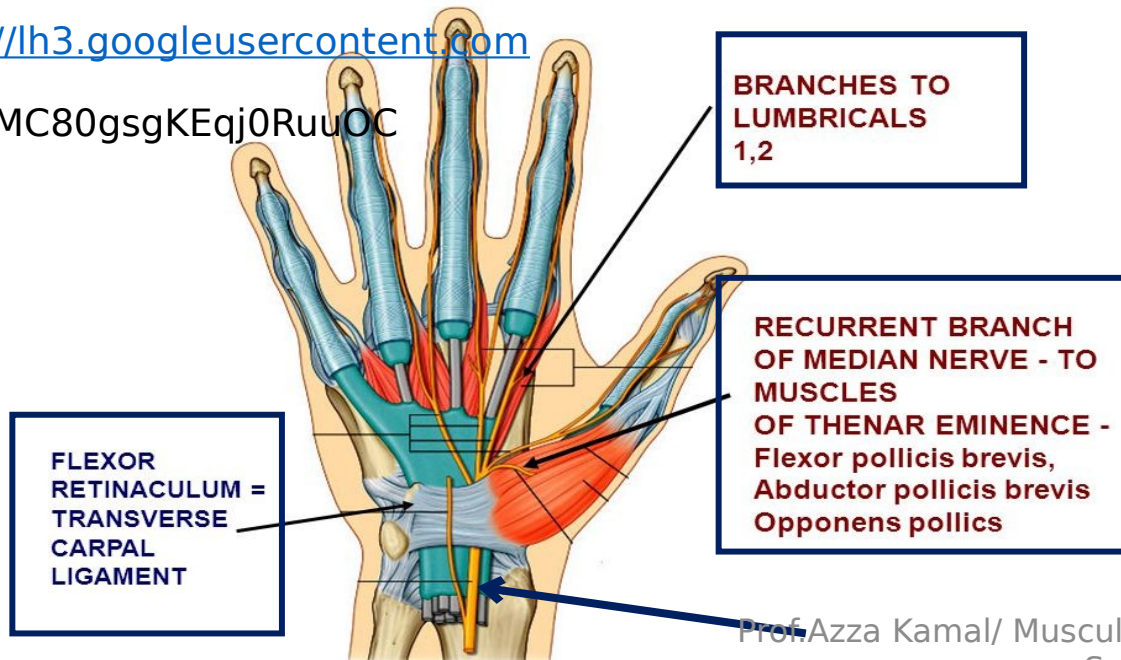


# Median nerve in the Palm:

- Enters palm **deep** to flexor retinaculum
- Branches: **LOAF** (Lat 2 Lumbricals/ **OP/APB/FPB**)
  1. To 3 muscles of thenar eminence + lateral 2 lumbricals
  2. To skin of palmar aspect of lateral 3½ fingers & dorsum of terminal & middle phalanges

MOTOR BRANCHES OF MEDIAN NERVE TO MUSCLES OF HAND PASS THROUGH THE CARPAL TUNNEL

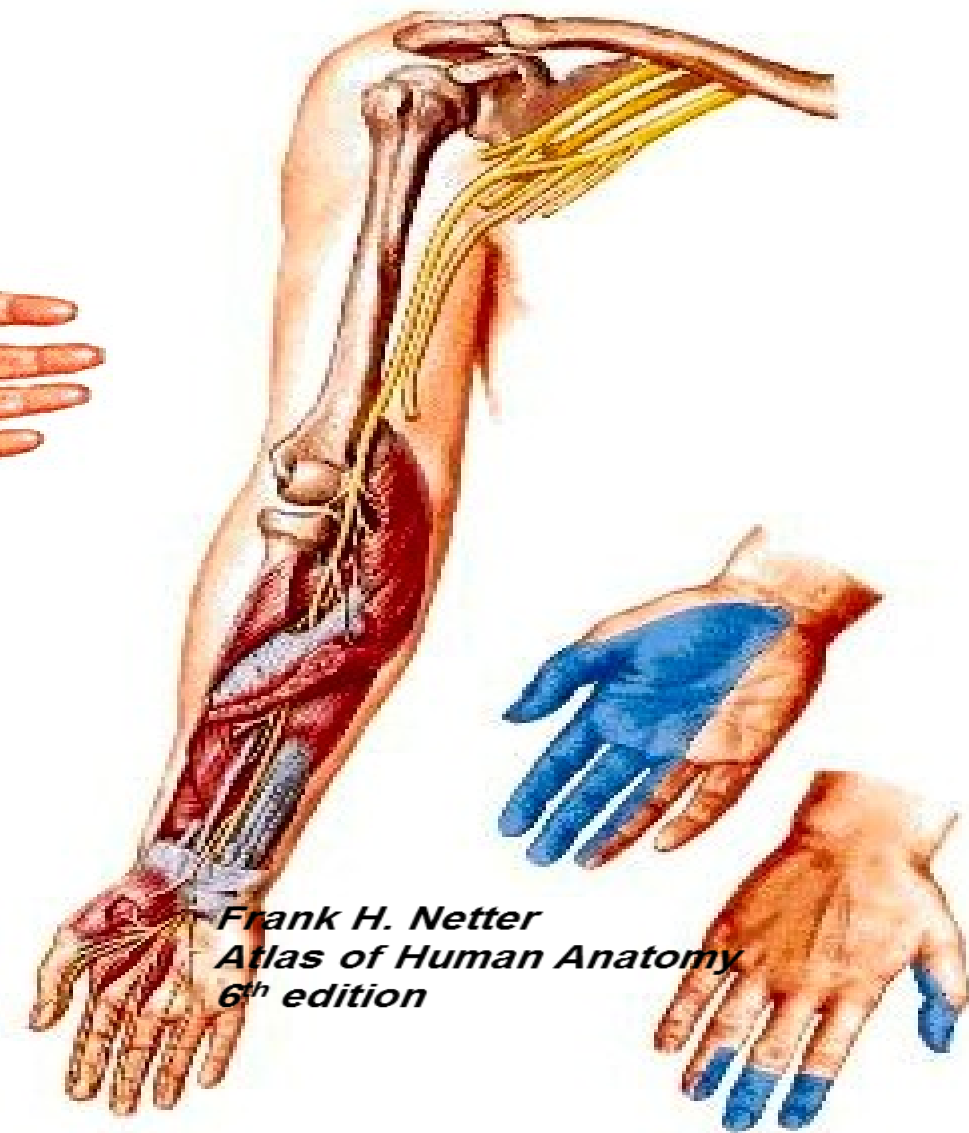
<https://lh3.googleusercontent.com/L4nIOMC80gsgKEqj0RuuOC>



*Frank H. Netter  
Atlas of Human Anatomy  
6<sup>th</sup> edition*

# LESIONS OF MEDIAN NERVE

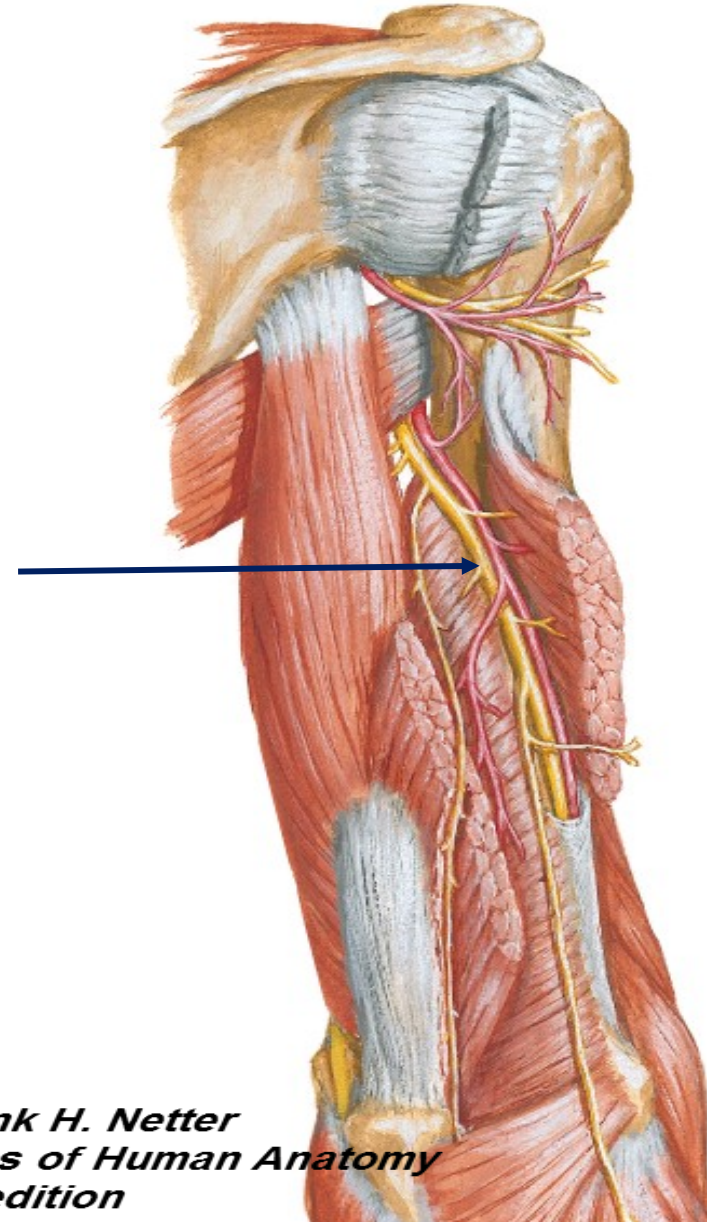
- **Effects: “Ape hand”**
  - **Paralysis** of thenars □
    - 1.Flat thenar eminence
    - 2.Lost thumb opposition
    - 3.Weak thumb abduction & flexion
  - **Sensory loss** in lat. 3½ fingers [palmar surface & middle & distal phalanges dorsally].



<b>Deformity</b>	<b>Nerve Injured</b>
<b>Winging of scapula</b>	<b>Long thoracic nerve</b>
<b>Flat shoulder</b>	<b>Axillary nerve</b>
<b>Ape hand</b>	<b>Median nerve</b>
<b>Partial claw hand</b>	<b>Ulnar nerve</b>
<b>Complete claw hand</b>	<b>Median and Ulnar</b>
<b>Waiter's tip position</b>	<b>Upper trunk of BP (Erb's Paralysis)</b>
<b>Complete claw hand</b>	<b>Lower trunk of BP ( Klumpke's Paralysis)</b>

# Let's revise the anatomy of the radial nerve

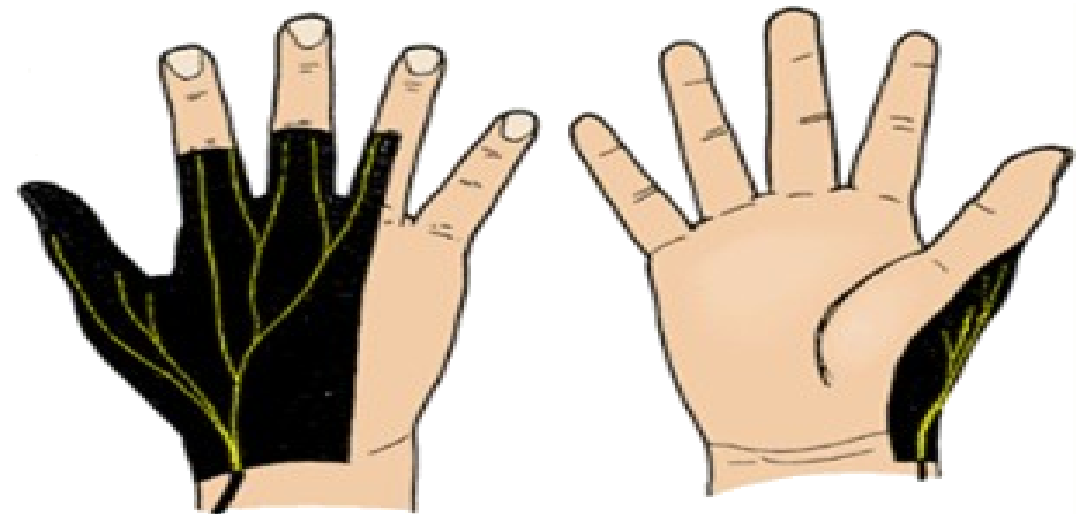
1. In Axilla
2. In lower triangular space
3. In spiral groove
4. Ends in front of lateral epicondyle of humerus by dividing into:
  - a) Superficial terminal branch □ runs lateral to radial artery in forearm under cover of brachioradialis
  - b) Deep terminal branch ( Posterior interosseous) □ pierces supinator and supplies extensors of forearm **Except**



*Frank H. Netter  
Atlas of Human Anatomy  
6th edition*

# LESIONS OF RADIAL NERVE

- In axilla & spiral groove
  - Wrist drop & finger drop
- Injury of post. interosseous n
  - **Effects:** finger drop but no wrist drop since ECRL received its ns
- Injury of superficial terminal br of radial n
  - **Effect:** anesthesia over dorsum of (lat 2/3 of hand & lat. 3½ fingers)





# Femoral Triangle



## Contents of Femoral

1-Femoral **Triang**'

artery.

2-Femoral vein.

3-Femoral

sheath.

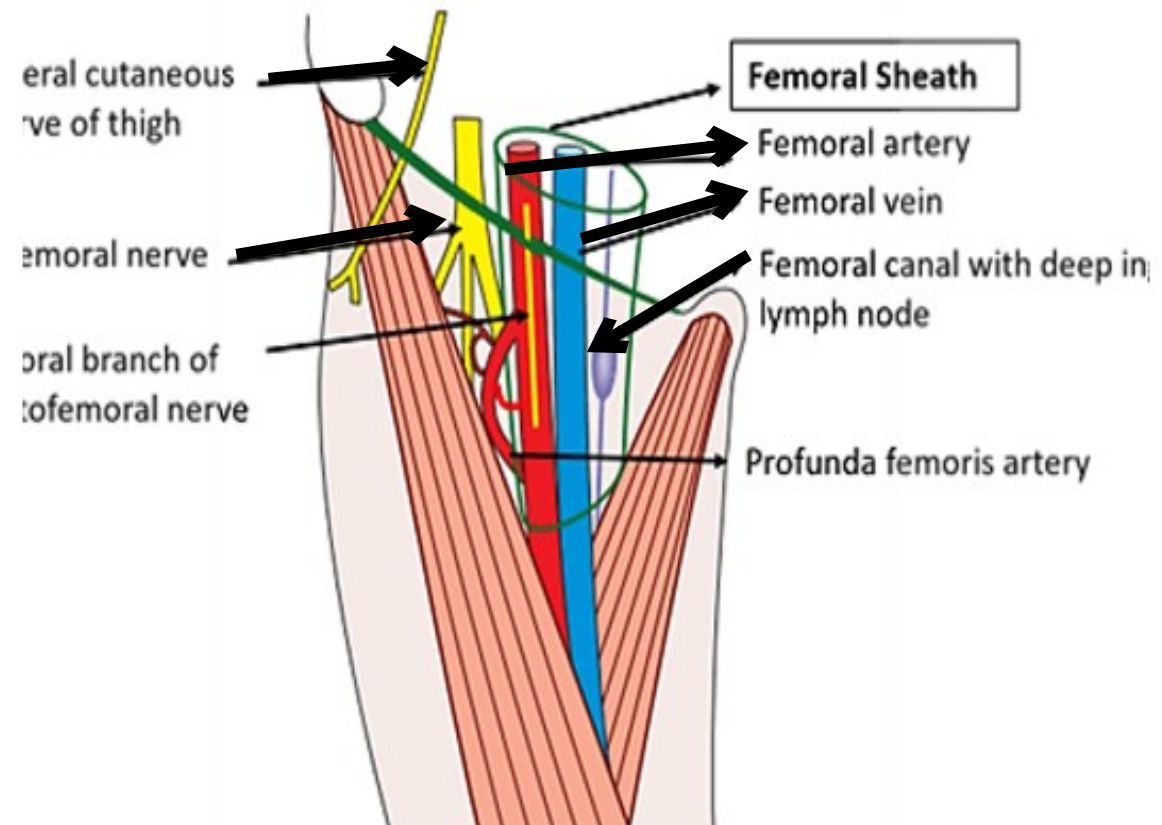
4-Femoral nerve.

6-Lateral

cutaneous nerve

of thigh

Contents of femoral Triangle



# Movements of hip joint

Movement	Main muscles
<b>1) Flexion</b>	<b>Muscles which lie anterior to hip joint</b> Psoas major & iliacus (Iliopsoas) □ most important + sartorius, rectus femoris & pectineus
<b>2) Extension</b>	<b>Muscle at back of hip+ Muscles at back of thigh</b> Gluteus maximus + hamstrings
<b>3) Abduction</b>	<b>Muscles on lateral aspect of hip</b> Gluteus medius& minimus + sartorius & tensor fasciae latae
<b>4) Adduction</b>	<b>Muscles on medial aspect of thigh (adductors)</b> Adductors longus, brevis & magnus + gracilis & pectineus
<b>5) Medial rotation</b>	<b>Anterior fibers of glutei medius &amp; minimus + adductors</b>
<b>6) Lateral rotation</b>	<b>6 lat rotators + gluteus maximus</b>



# Movements of knee joint

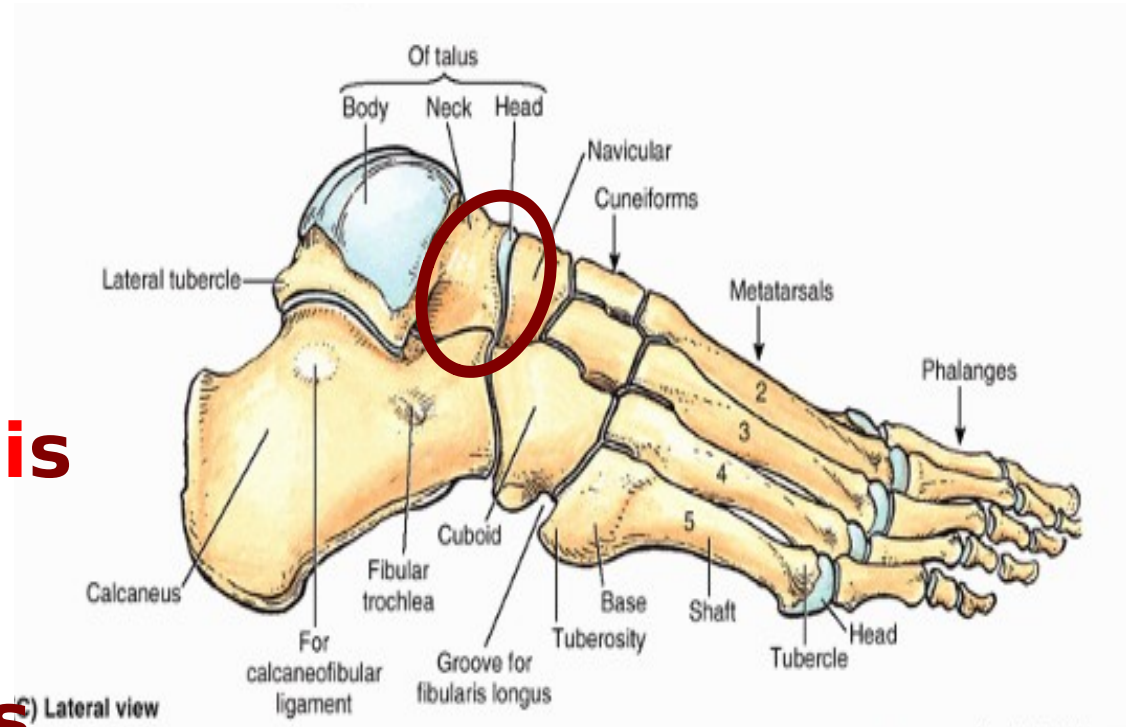
- 1. Flexion** □ hamstrings + popliteus, sartorius & gracilis  
(with foot on the ground □ gastrocnemius & plantaris)
- 2. Extension** □ quadriceps femoris + tensor fascialatae
- 3. Medial rotation** □ semimembranosus + SGS
- 4. Lateral rotation** □ biceps femoris

# Locking and unlocking of the knee joint

- **Unlocking** of the knee is lateral rotation of FEMUR at the beginning of flexion □ produced by **popliteus**

# Talocalcaneonavicular joint VERY IMPORTANT

- **Type: ball & socket synovial joint**
- **Movement:**
  - **Inversion of foot** □ **by tibialis anterior & tibialis posterior**
  - **Eversion of foot** □ **peroneus longus, brevis & tertius**



<https://lh3.googleusercontent.com/qX5NveMHFj-i>

# Ankle Joint

- **Movements:**

- 1) Dorsiflexion:** done by muscles of the **anterior** compartment of leg (**the ankle joint is locked in dorsiflexion** as the wider anterior border of the trochlear surface of talus becomes lodged in the socket).
- 2) Plantar flexion:** done by muscles of the **posterior & lateral** compartments of leg.

Muscle	Movement
Iliopsoas	Powerful flexor (s)
Gluteus maximus	Powerful extensor(s)
Sartorius	Flex (es) hip and knee
Rectus femoris	Flex (es) hip but extend (s) knee
Popliteus	Unlock(s) knee joint
Glutei medius & minimus	Prevent(s) tilting of pelvis during walking
Tibialis anterior & tibialis posterior	Invert (s) foot



# Nerves of lower limb

**Femoral nerve:** L 2, 3 & 4

dorsal divisions

.It is the largest branch of lumbar plexus.

.It is main nerve supply of anterior compartment of the thigh.

. -It leads to:

a)**Motor effect:** Paralysis of quadriceps femoris muscle → Knee cannot be extended.

b)**Sensory effect:** Loss of sensation on anteromedial side of the thigh and medial side of the leg & the foot.

# Nerves of lower limb

Superior gluteal nerve: L 4,  
5 S 1

- .It is a branch of sacral plexus.
- . supply the gluteus medius, gluteus minimus & tensor fasciae latae.
- .Injury leads to:
  - 1.**Lurching gait** in case of unilateral affection. The patient complains that in standing on the affected side, the pelvis will tilt towards the unsupported side (**positive Trendelenburg's sign**).
  - 2.**Waddling gait** in case of bilateral affection. The patient complains that during walking the trunk is flexed from side to side with each step.



# Nerves of lower limb

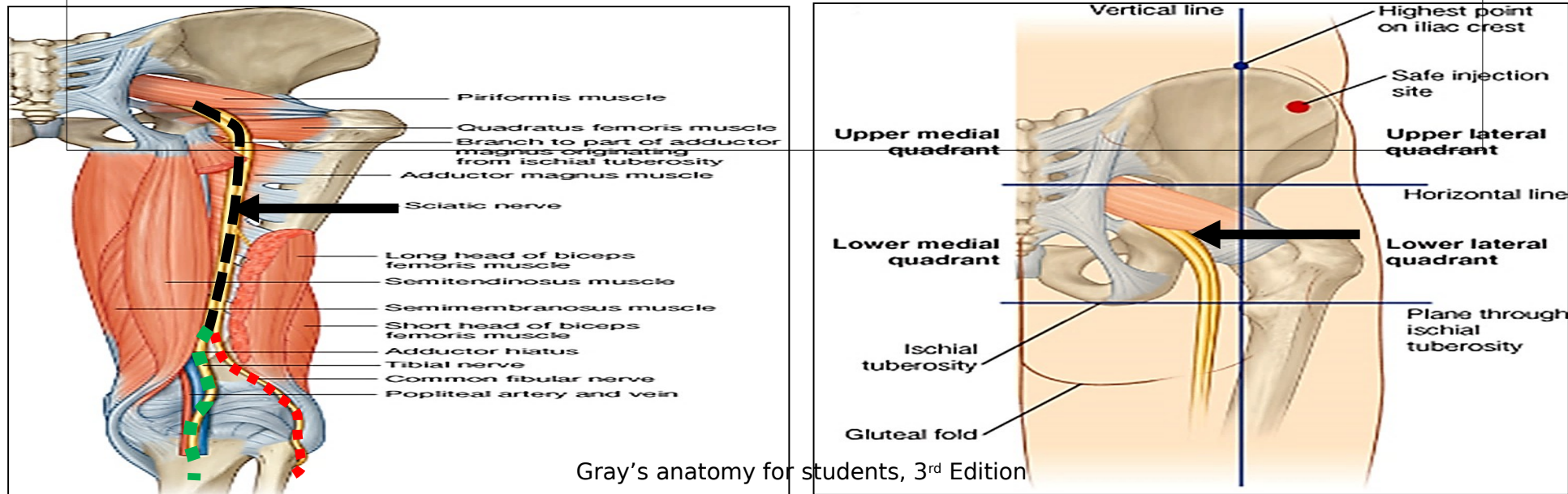
**Sciatic nerve:** L 4, 5 S 1, 2 & 3 ventral & dorsal divisions

**.It is the largest branch of sacral plexus. It is the thickest nerve in the body.**

**.It terminates at superior angle of the popliteal fossa by dividing into 2 terminal branches:**

**-Tibial N. [L 4, 5 S 1, 2 & 3 ventral divisions]**

**-Common peroneal N. [L 4, 5 S 1, 2 dorsal divisions].**



## .Effect of injury of sciatic nerve:

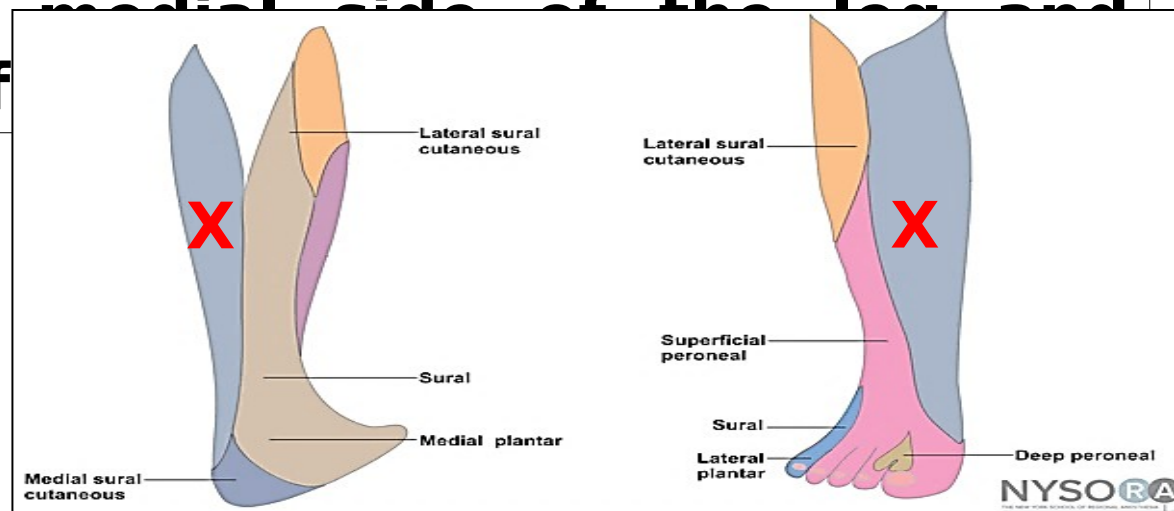
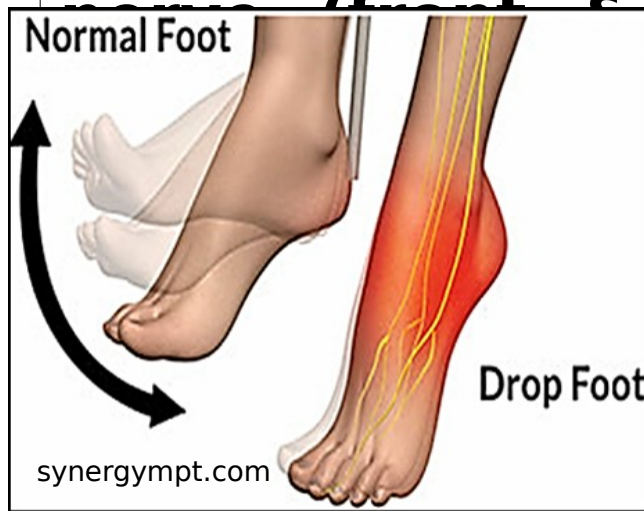
### 1.Motor effect:

-Hamstring muscles are paralyzed, but weak flexion of the knee is possible because of the action of sartorius (femoral nerve) & gracilis (obturator nerve).

-All the muscles below the knee are paralyzed.

.Deformity: Foot drop. Effect of gravity

2.**Sensory loss:** Sensation is lost below the knee except the area supplied by saphenous nerve (front & medial side of the leg and



## 5] **Common peroneal nerve:** L 4, 5 S 1, 2

dorsal divisions

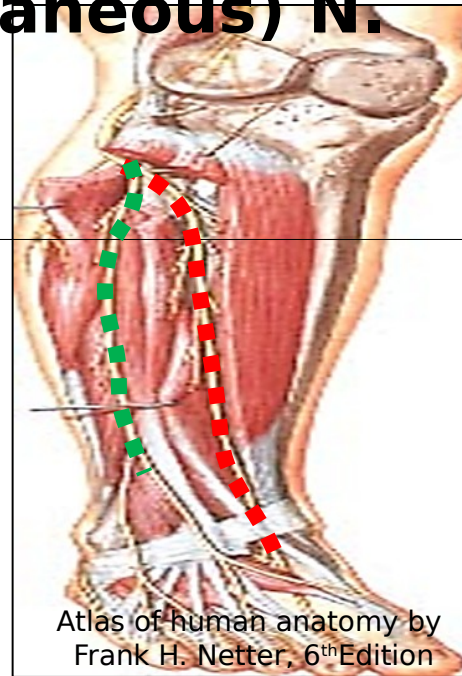
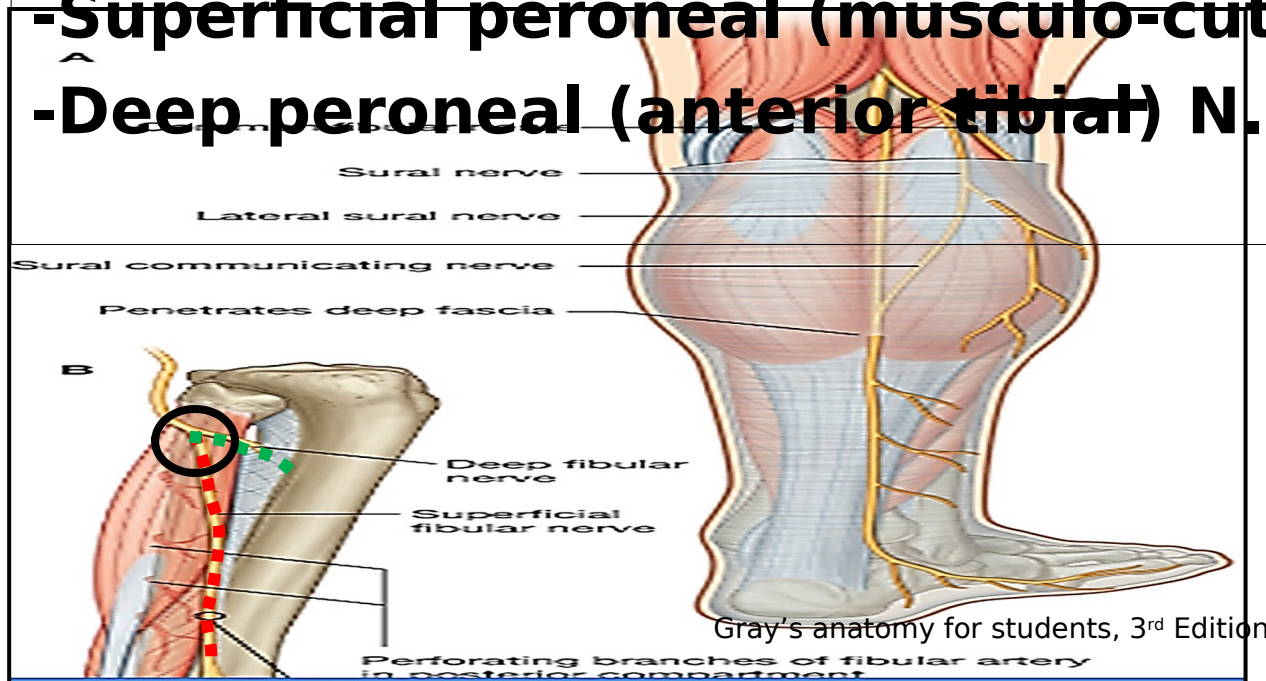
.It is the smaller of the 2 terminal branches of sciatic nerve.

.It is the nerve of lateral & anterior compartments of the leg and dorsum of the foot.

.It terminates on lateral side of the neck of fibula by dividing into:

-Superficial peroneal (musculo-cutaneous) N.

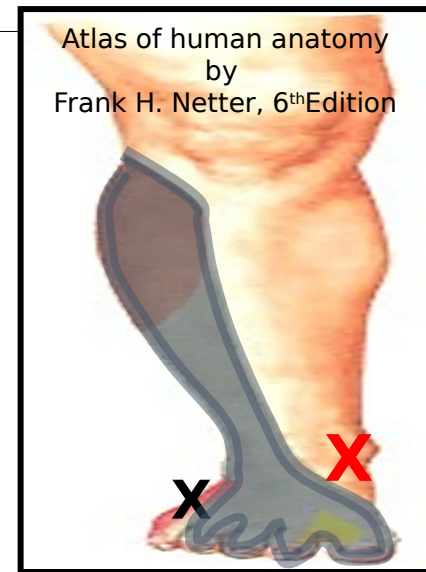
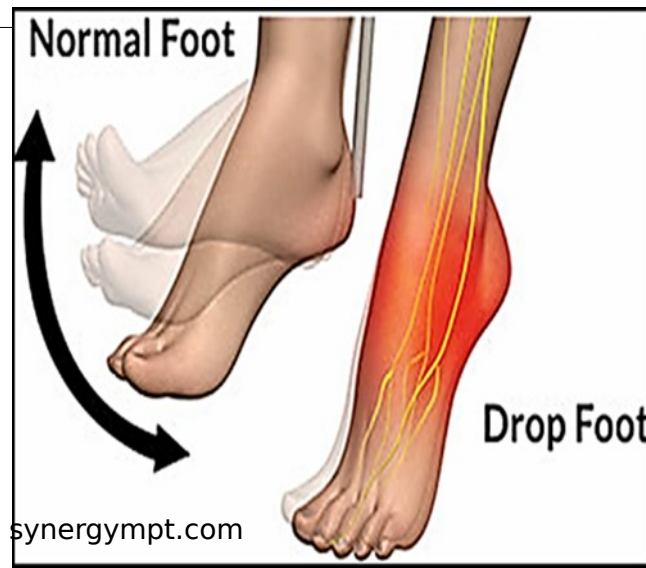
-Deep peroneal (anterior tibial) N.



## ■ Common peroneal nerve injury:

**-Motor:** Muscles of anterior and lateral compartments of leg are paralyzed. (loss of dorsiflexion & eversion)

**-Sensory:** Loss of sensation on the anterior & lateral sides of the leg and dorsum of the foot & toes except areas supplied by sural & saphenous nerves.





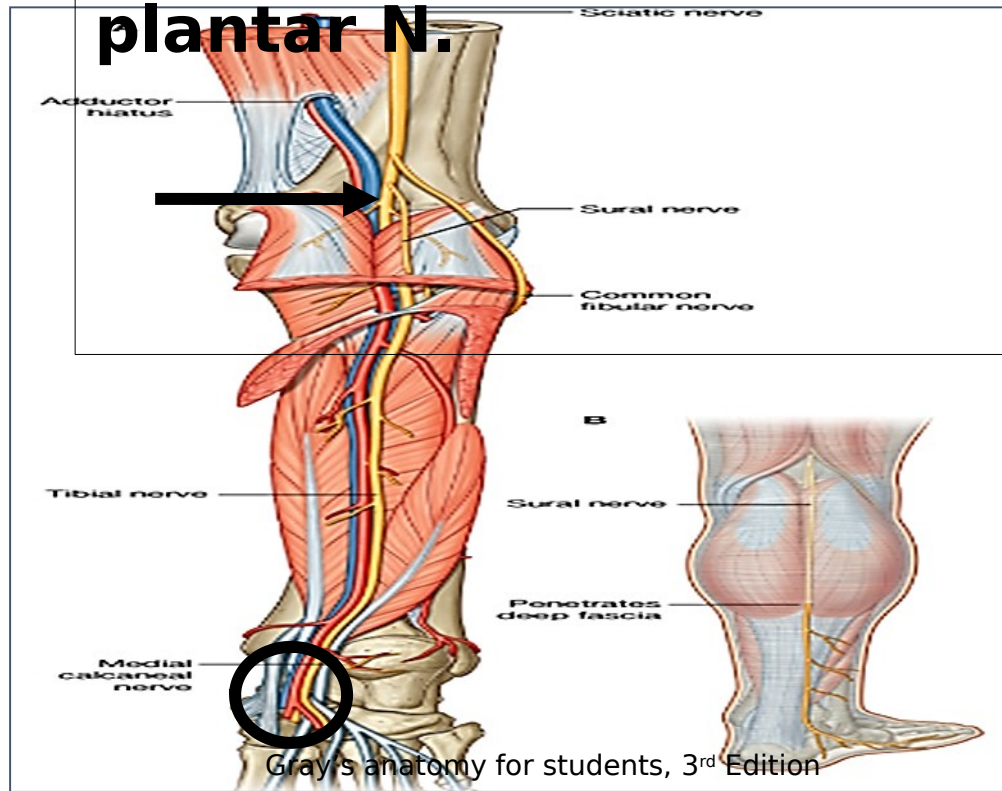
## 6] **Tibial nerve:** L 4, 5 S 1, 2 & 3

ventral divisions

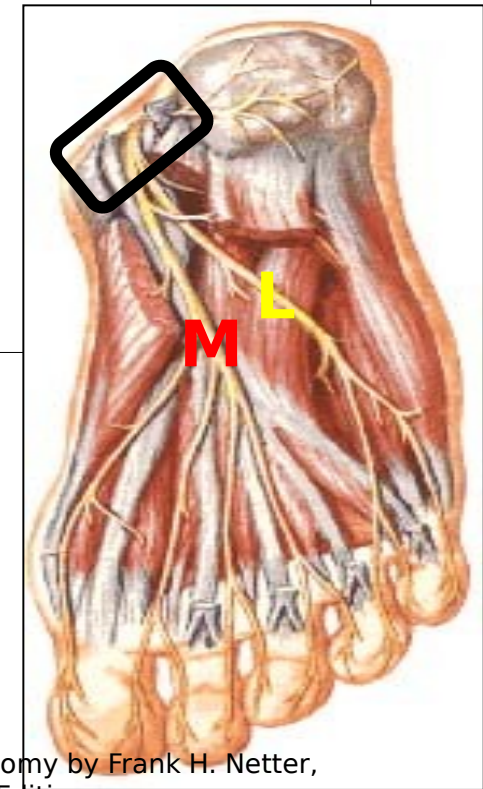
.It is the larger of the 2 terminal branches of sciatic nerve.

.It is the nerve of posterior compartment of the leg and sole of the foot.

.It passes deep to the flexor retinaculum by dividing into: Medial plantar N. & lateral plantar N.



Gray's anatomy for students, 3<sup>rd</sup> Edition

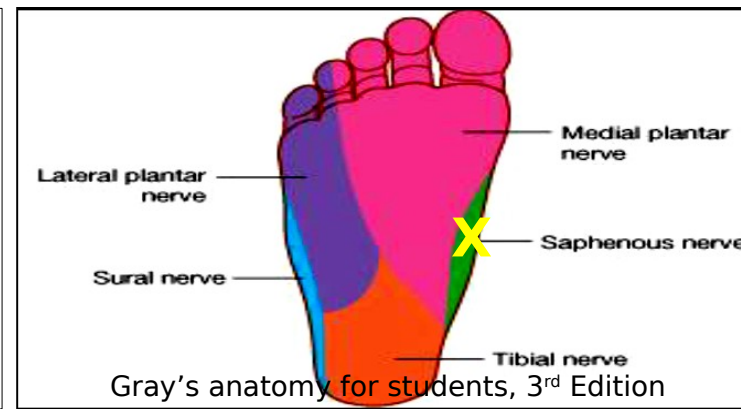


Atlas of human anatomy by Frank H. Netter,

## ■Tibial nerve injury:

**-Motor: All muscles in the back of the leg & sole of the foot are paralyzed, resulting in loss of plantar flexion of foot**

**-Sensory: Loss of sensation on the sole of the foot. Later, trophic ulcers develop. *Except area supplied by saphenous N.***



# Arteries of the Lower Limb

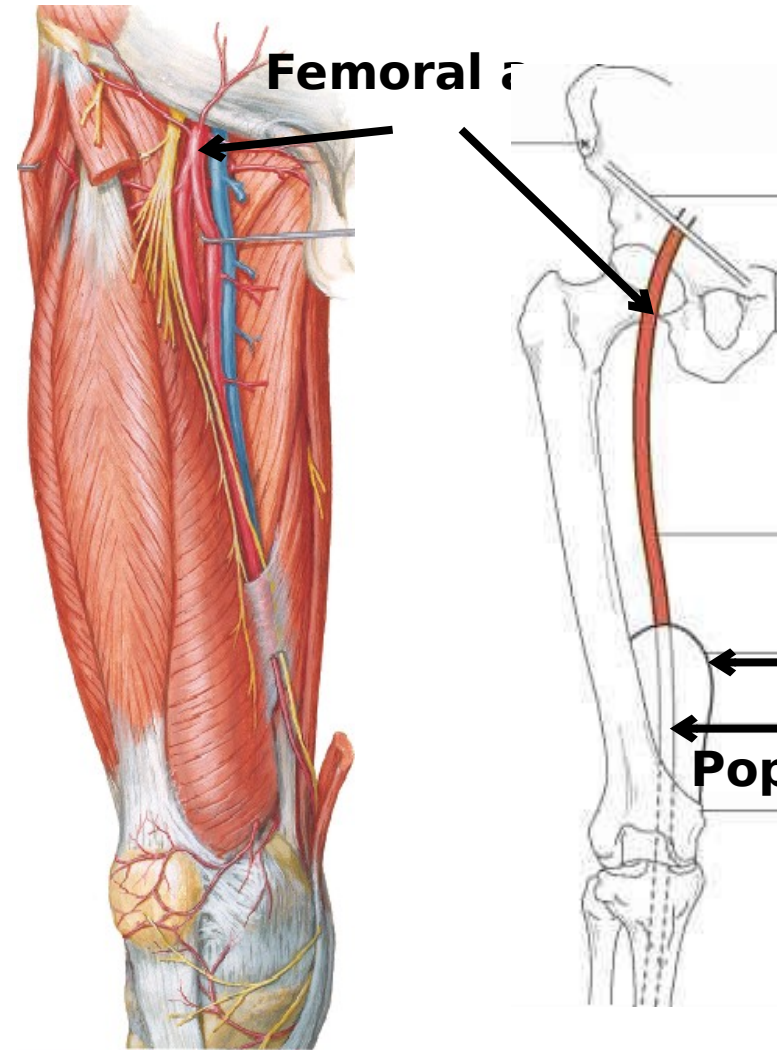


## Femoral artery

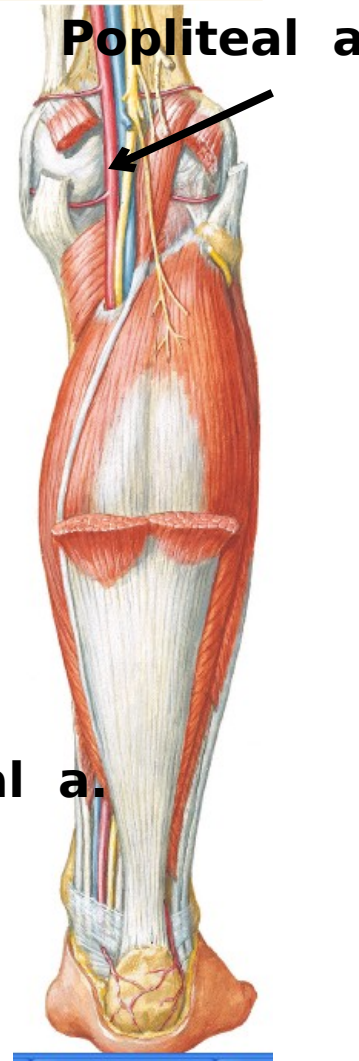
**Begins** as direct continuation of the **external iliac artery**.

**Ends** as **popliteal artery** in the **popliteal fossa**.

Popliteal artery ends in the popliteal fossa by  
Dividing into **anterior & posterior tibial arteries** to supply the leg & foot.



Frank H. Netter. 4<sup>th</sup> edition



Frank H. Netter. 4<sup>th</sup> edition

<https://www.clicktocurecancer.info/clinical-features/vessels-1.html>



# Arteries of the Lower Limb



**Branches of the femoral artery:**

Superficial branches

Deep branches:

**Profunda Femoris**

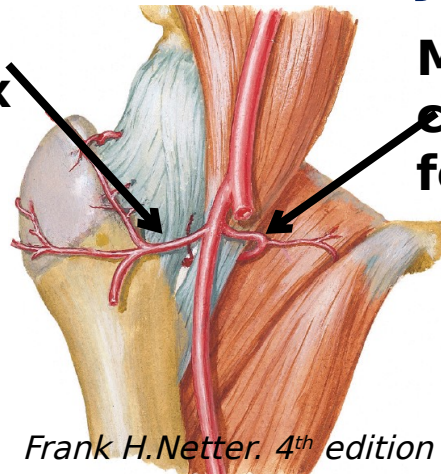
**Medial & lateral circumflex femoral arteries**

Four perforating arteries .

**Descending genicular ( knee joint)**

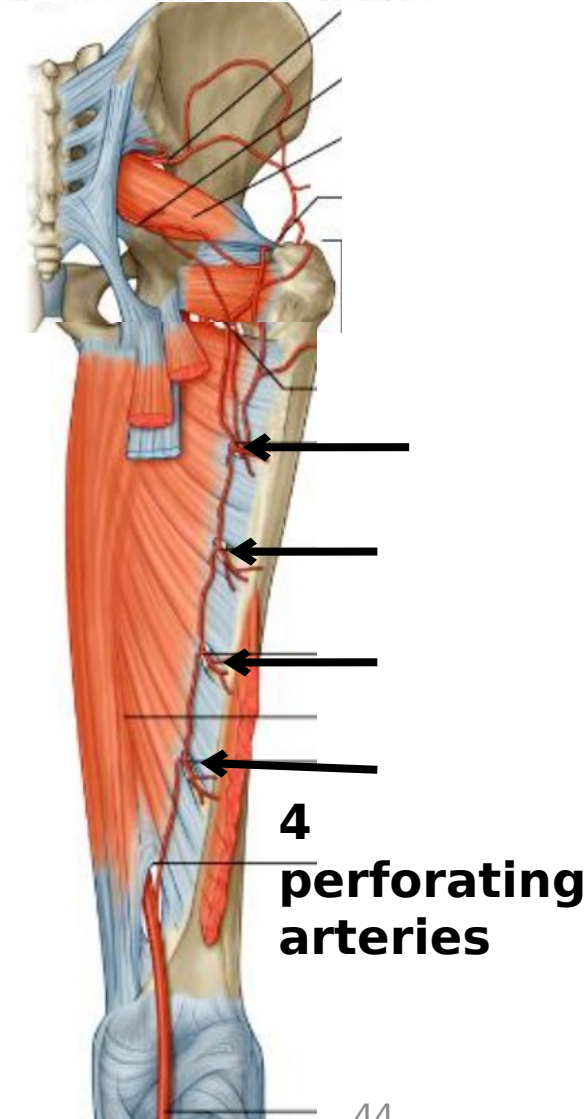
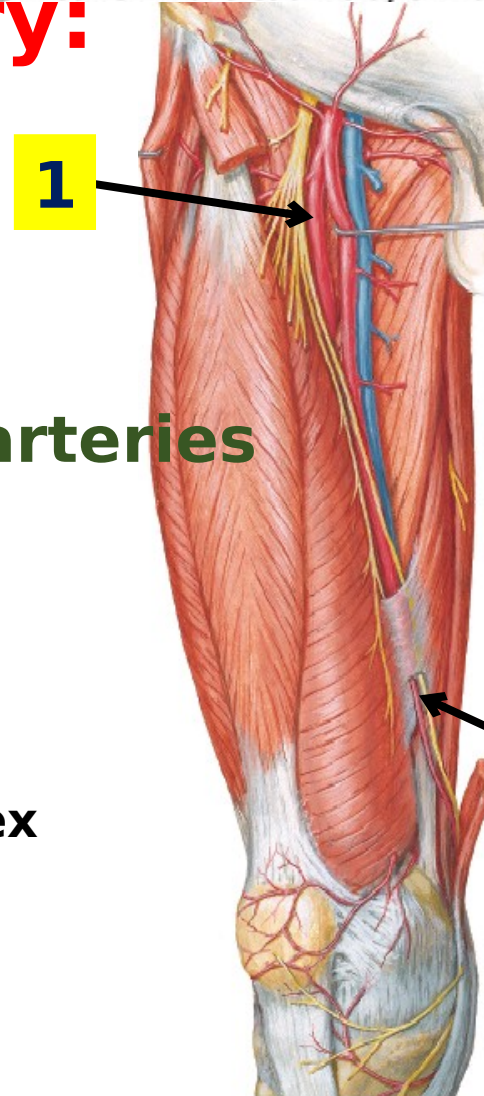
lateral  
circumflex  
femoral

Medial  
circumflex  
femoral



Frank H. Netter. 4<sup>th</sup> edition

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# Arteries of the Lower Limb



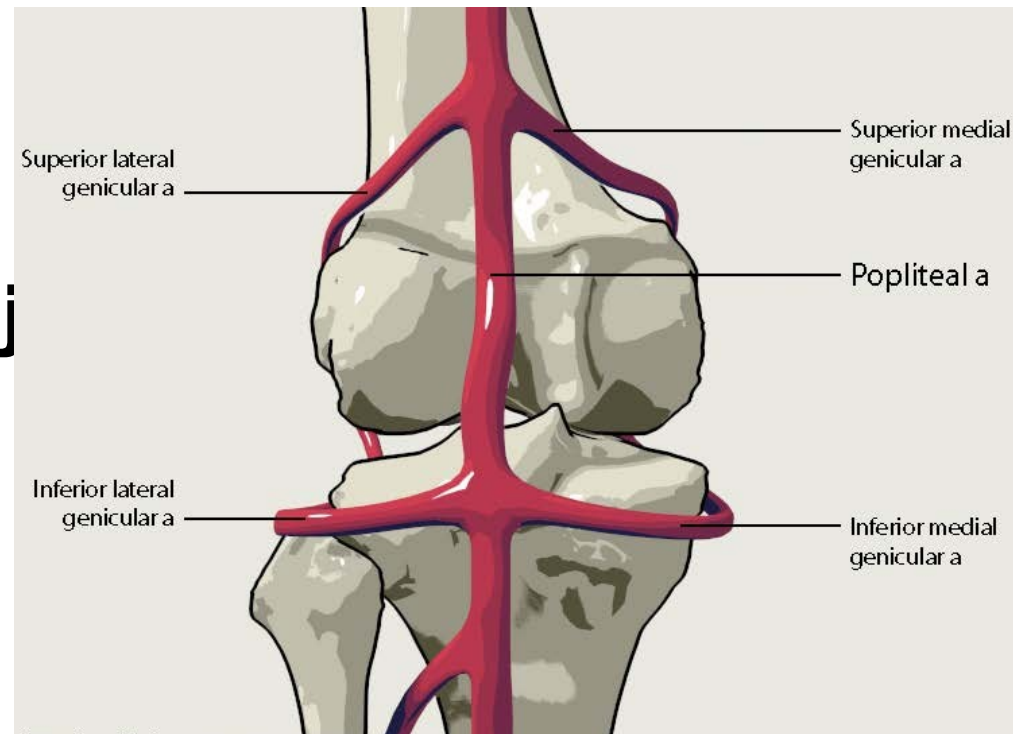
## Popliteal artery

### Branches:

1. Muscular
2. Cutaneous
3. Articular

### (Genicular)

branches ( 5 ) Knee joint



[://www.google.com/search?q=femoral+popliteal+artery&source=lnms&tbn=isch&sa=X&ved=0ahUKEwiQ6faliqzhAhULJhoKHa5VCjEQ\\_AUIDigB&biw=1366&bih=657#imgrc=8-9T\\_oqVQI9p2M:](https://www.google.com/search?q=femoral+popliteal+artery&source=lnms&tbn=isch&sa=X&ved=0ahUKEwiQ6faliqzhAhULJhoKHa5VCjEQ_AUIDigB&biw=1366&bih=657#imgrc=8-9T_oqVQI9p2M:)

# Arteries of the Lower Limb

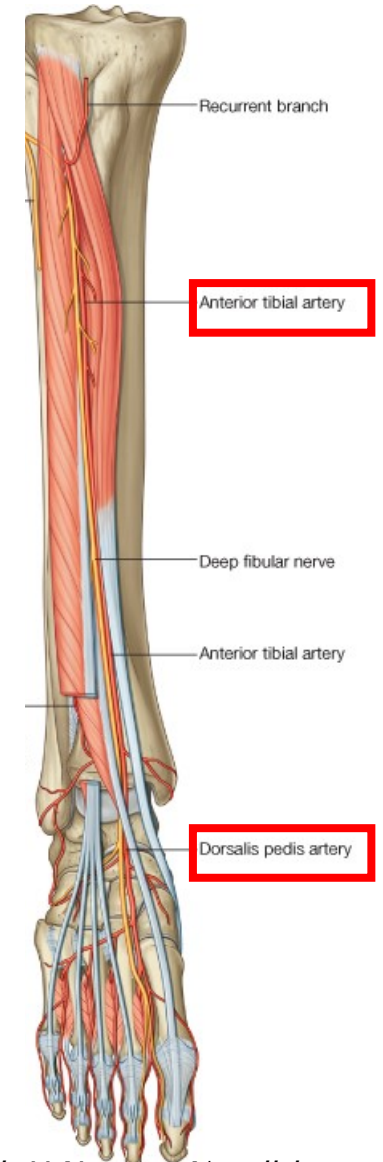


## Anterior tibial artery

- **Origin:** One of the 2 terminal br. of popliteal artery

**Termination:** Continues as **Dorsalis pedis** in front of ankle.

- **Branches:**
  1. **recurrent a.** (knee)
  2. **Muscular**
  3. **Malleolar a.** (ankle)

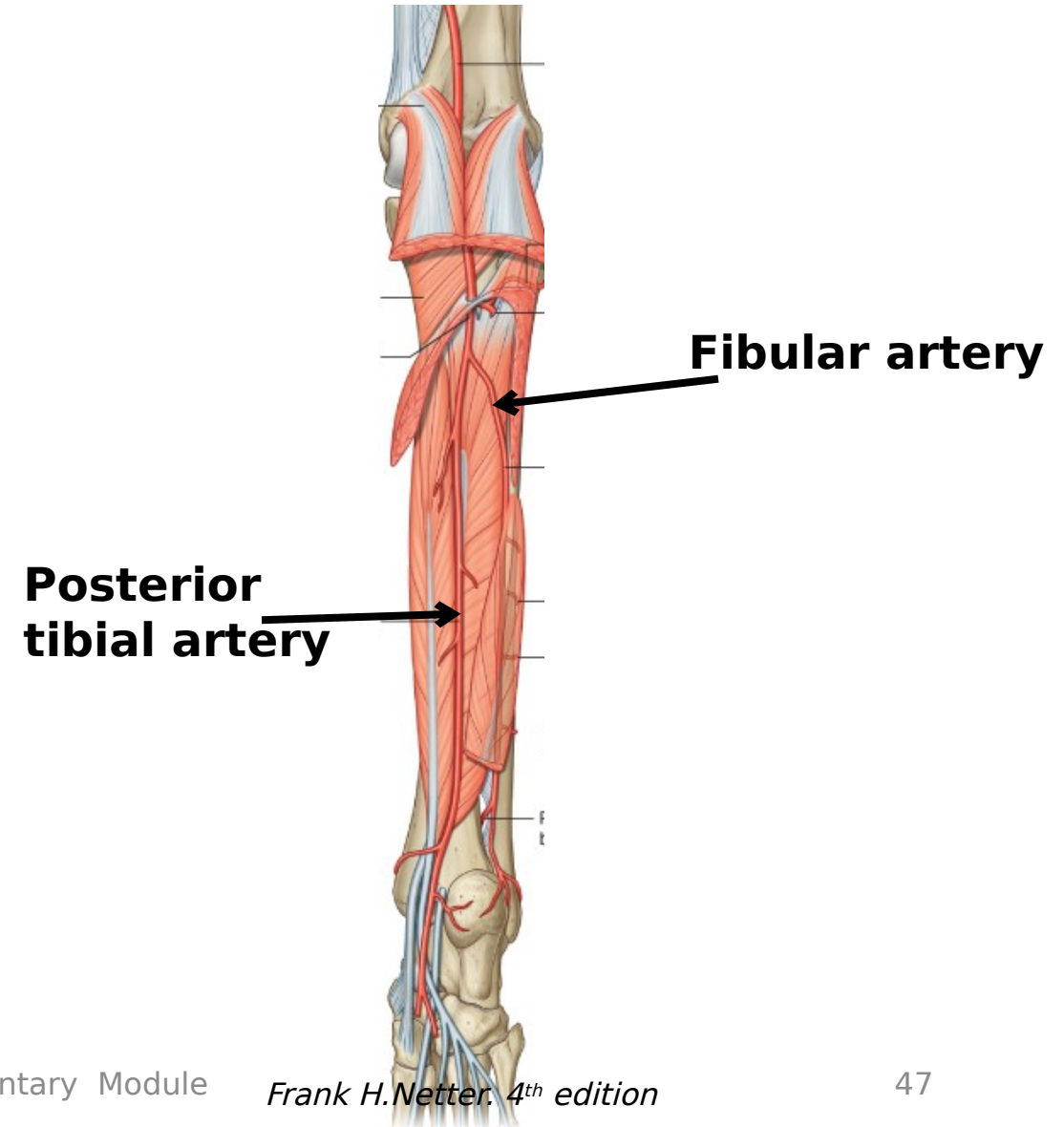


# Arteries of the Lower Limb



## Anterior tibial artery

- **Origin:** The larger of the 2 terminal br. Of popliteal artery
- **Termination:** by dividing into **medial & lateral plantar arteries**
- **Branches:**
  1. **Fibular**
  2. **Circumflex fibular (Knee)**
  3. **Medial Malleolar & calcaneal (ankle)**





**Thank You**